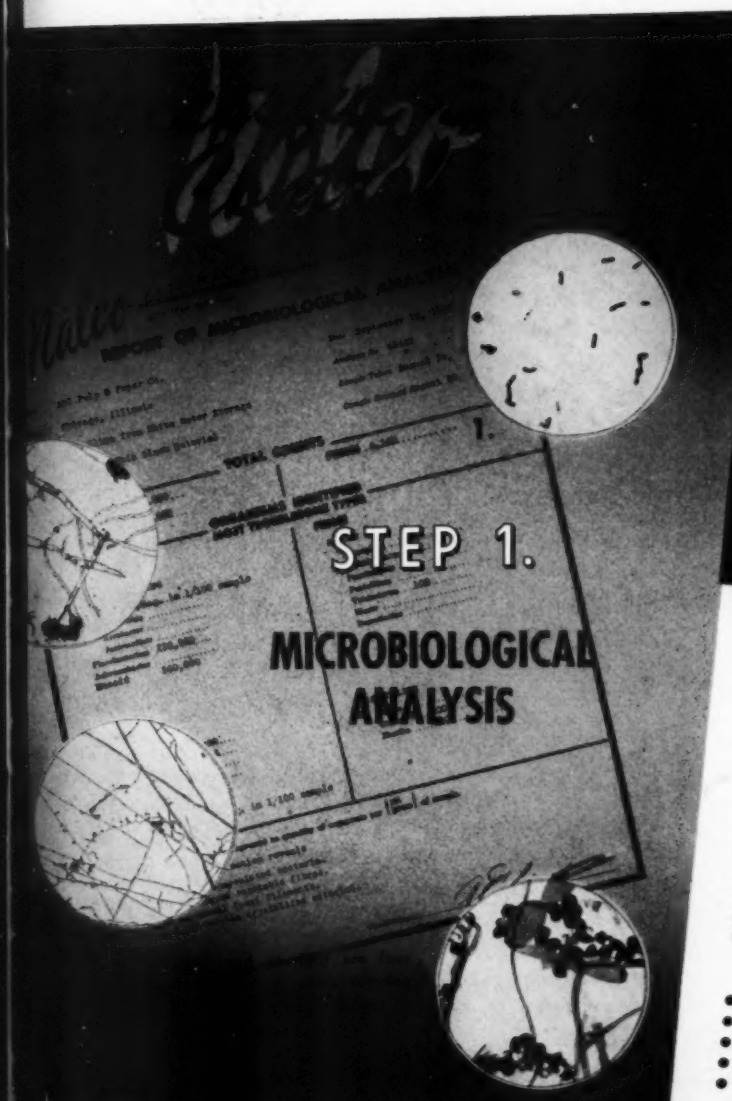
TECHNOLOGY DEPT.

The Paper Industry

A Focus Issue

To Increased Productivity

PUBLIC LIBRARY



THE Nalco-developed method of identification of slime-forming organisms is the important first step in the Nalco System of *successful* slime control. Nalco experts collect samples at proper points throughout your mill. These samples are analyzed in the Nalco Laboratories, where the finest equipment and scientific skill insure correct reports. Analysis reports provide a firm base upon which to recommend effective, economical slimicide treatment.

Where bacterial conditions change with the seasons, or vary due to local conditions, routine Nalco microbiological analyses detect these changes and point the way to successful year-around slime control.

The complete Nalco System, outlined below, can be put to work in your mill on short notice to provide continuing, successful slime control. Write for details today.

The *Nalco* System of Slime Control

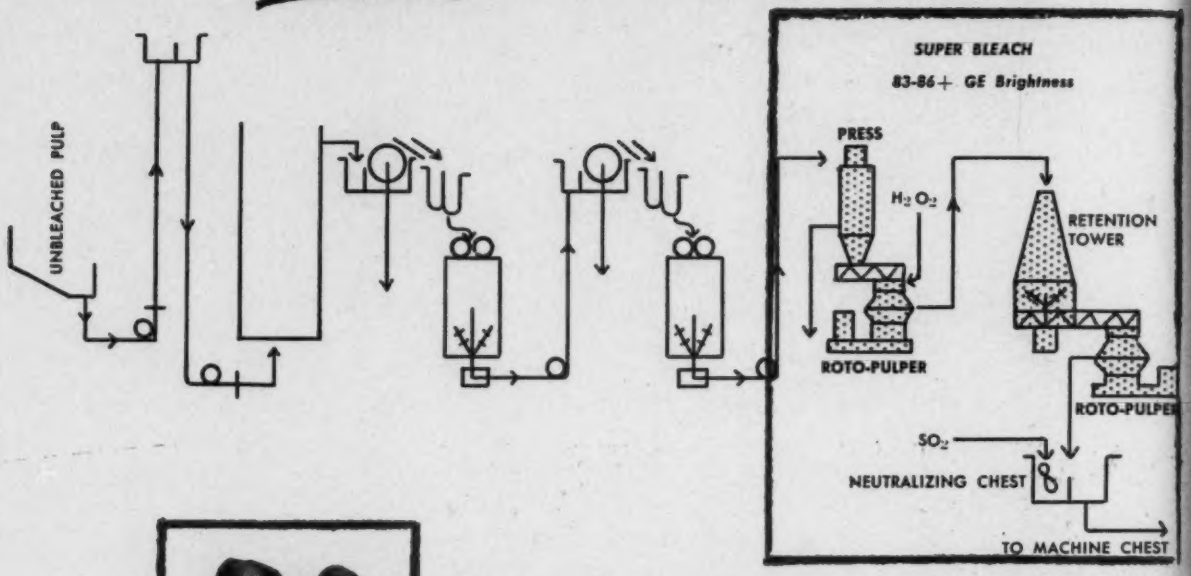
- Microbiological Survey.
- Engineering Survey.
- Chemical Survey.
- Selection and application of treatment.
- Regular service calls, routine analyses, and mill checks.

NATIONAL ALUMINATE CORPORATION
6232 W. 66th Place • Chicago 38, Illinois

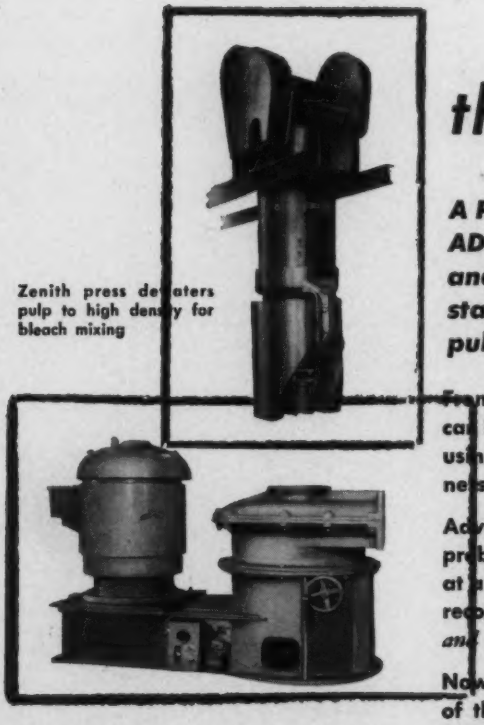
Canadian inquiries should be addressed to Alchem Limited, Burlington, Ontario, Canada

Nalco

GET HIGHER BRIGHTNESS



through SUPER bleaching!



Zenith press dewaters pulp to high density for bleach mixing

015 Roto-Pulper serves as bleach mixer, second Roto-Pulper as a denodulizer.

A PREMIUM PULP . . . GREATER PROFITS . . . PLUS THESE ADVANTAGES: ECONOMICAL—lower chemical, steam and power costs. LOW CAPITAL COST—only one extra stage of high density required. SAFE—no damage to pulp physicals . . . yield retained . . . no reversion.

From a semi-bleached pulp with a brightness of 71-73 GE, most pulps can be readily superbleached to 83-85 GE with one extra stage (above) using peroxide at high density. Under favorable conditions brightnesses approaching 90 GE can be obtained.

Advantages of high density bleaching and some of the inherent problems, including difficulty of introducing and distributing bleach at a uniform rate and eliminating nodules or "knots", have long been recognized. *(See "Manufacture of Pulp and Paper", pp 855-6, para. 28 and p 878, para. 51.)*

Now both of these obstacles have been removed with development of the Jackson & Church Roto-Pulper. Three years' plant experience proves conclusively that Roto-pulpers successfully mix bleach in desired quantities on a continuous basis and remove troublesome nodules.

With these problems solved, the industry now can take full advantage of high density bleaching and its inherent features.

Our engineers are ready to assist with your paper and pulp processing problems. Write to Zenith Division, Dept. PI.

J-C

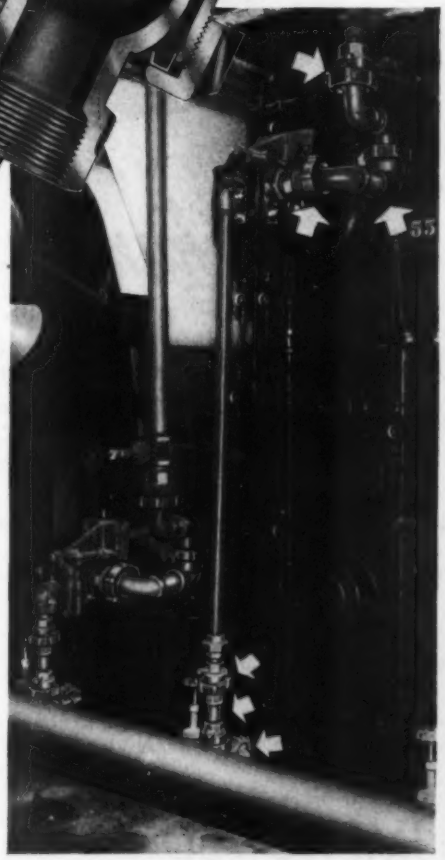
JACKSON & CHURCH CO. SAGINAW, MICHIGAN

Work well done since eighty-one

NOW! A Better Piping Hook-Up for Paper Machines

BARCO *Flexible* **BALL JOINTS**

"MOVES IN ANY DIRECTION"



THESE pictures show how a number of paper mills and leading machine builders are now using Barco Ball Joints to make trouble-free *flexible* piping connections to dryers.

OVERCOMES "CONNECTOR FAILURES"—Failures experienced in other flexible connectors have been traced to a characteristic *"double twisting"* action set up by expansion and contraction in long steam supply and condensate return headers.

ACCOMMODATES ALL MOVEMENT—Barco Ball Joints readily accommodate movement in any direction, *including swivel action.* Used in combination with standard iron pipe, they provide leakproof flexible connections for steam and condensate lines that are practically indestructible.

AVAILABLE NOW—Barco engineers and representatives are ready with recommendations for hook-ups and joints to meet your particular needs. *Call or write today!*

BARCO *Manufacturing Co.*

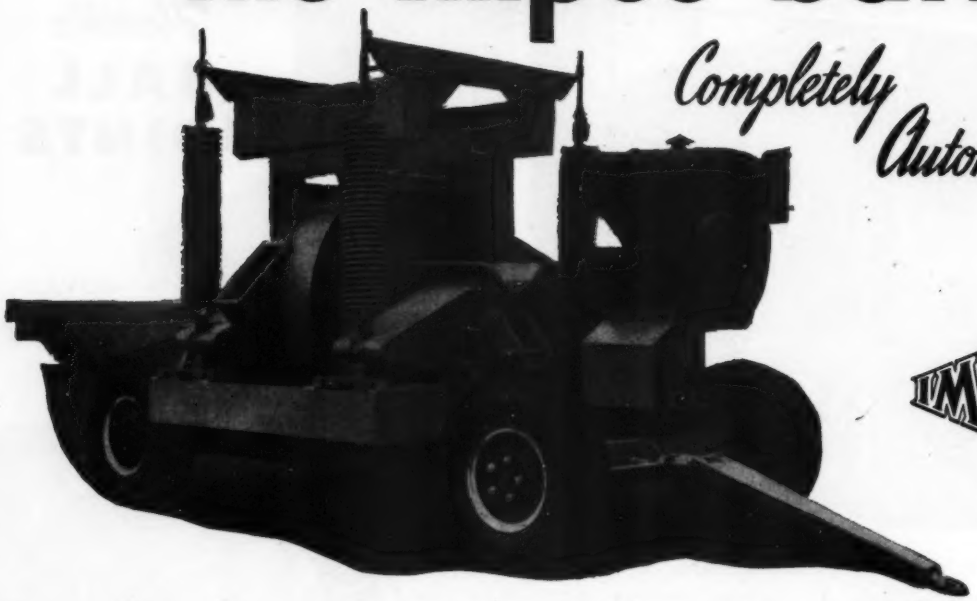
526F Hough St., Barrington, Ill. • In Canada: The Holden Co., Ltd., Montreal

FREE ENTERPRISE—THE CORNERSTONE OF AMERICAN PROSPERITY

Introducing

the Impco barker

Completely Automatic



IMPCO

Easily handles irregular shaped logs!

The Impco Barker has been developed to meet today's high bark removal requirements combined with low wood loss.

It is available as a stationary unit for general wood yard barking or as a portable unit mounted on a heavy frame equipped with tires for highway towing. The mobile unit can be furnished with a self-propelling drive for moves between barking sites.

Capacities up to 20 cords per hour depending on conditions, size and type of wood can be expected.

Specifications:

Wood size —
4' to 8' in length, 4" to 18" in diameter
Feed Rate —
30 to 120 f.p.m.
Infeed and Outfeed Conveyors —
Automatic self-centering self-sizing
Barking Tools —
6 springloaded — automatic sizing for variable log diameters
Bark Discharge —
Mechanical ejection
Drives —
Gasoline or electric powered

IMPROVED MACHINERY INC.

NASHUA • NEW HAMPSHIRE

Sherbrooke Machineries Limited, Sherbrooke, Quebec, manufacture similar equipment in Canada

F 1-a

The Paper Industry

Technology • Engineering • Management • Production

VOLUME 36 • NUMBER 2 • MAY 1954

Features . . .

A Focus Issue — *to increased productivity through successful operation of equipment and processes*

Are we operating at maximum productivity? 137
by A. W. J. Dyck
Increased productivity by integration 139
by Reavis C. Sproull
Woodyard operations 141
Barking and chipping operations 142
Groundwood pulping 144
Sulfite pulping 144
Semichemical pulping 146
Increasing quality and production in high yield kraft and semichemical pulps 148
by W. J. Nolan
Increasing quality and production in sulfite pulping 150
by George H. McGregor
Liquor and by-products recovery 152
Pulp refining and stock preparation 153
The paper machine 156
Air supply systems for drying and ventilation 159
Instrumentation 160
Acknowledgments 163
Well-planned and streamlined handling of products results in increased productivity 164

News . . .

News of the Industry 169
Allied News 184
Association News 186
Names in the News 189
Necrology 200
Safety News 202

Departments . . .

Current Comment 131
Financial Reports 131
Paper Sketches 165
Coming Events 187
Patent Reviews 206
Foreign Abstracts 210
New Products 217
New Literature 224
Current Market Quotations 228
Index to Advertisers 230

Published monthly by:
FRITZ PUBLICATIONS, INC.
Edward B. Fritz (1869-1939), Founder

Publication Staff:

President and General Manager
A. SCOTT DOWD

Vice President and Treasurer
A. C. L. FRITZ

Secretary
A. C. BRUCE

Editorial Director
A. W. J. DYCK, Ph.D.

News Editor
D. W. ZEIGLER

Editorial Assistant
CAROL M. JOHNSON

Sales Manager
R. M. McFARLAND

Production Manager
EDGAR C. FARREN

Circulation Manager
STANLEY E. BOIE

Advertising Representatives:

BOSTON 16: **Meade & Company,** 471 Statler Building, Liberty 2-9677.
CHICAGO 5: **Jack Henderson,** 431 South Dearborn Street, Wabash 2-3543.
CLEVELAND: **Charles E. Dowd,** 431 South Dearborn Street, Chicago 5, Illinois. Wabash 2-3543.
LOS ANGELES: **Murray Bothwell,** 234 East Colorado St., Pasadena, Calif., Ryan 1-9155.
NEW YORK 20: **L. S. van Nydeck,** 9 Rockefeller Plaza, Circle 7-3085.
NEW YORK 25: **Harry A. Johnston,** 945 West End Avenue, Academy 2-6984.
PORTLAND: **Murray Bothwell,** 234 East Colorado St., Pasadena, Calif., Ryan 1-9155.
SAN FRANCISCO: **Murray Bothwell,** 234 East Colorado St., Pasadena, Calif., Ryan 1-9155.

THE PAPER INDUSTRY—founded in 1919—known as "The Paper Industry and Paper World" from June, 1939, through December, 1949, assumed its original title with the January, 1950, issue.

Published at 1501 Washington Road, Mendota, Illinois.

Address all correspondence intended for publication to Editorial and Executive Office, 431 South Dearborn Street, Chicago 5, Illinois.

Member: Audit Bureau of Circulations, The Associated Business Publications.

Entered as second class matter February 18, 1954, at the post office at Mendota, Illinois, under the Act of March 3, 1879.

Subscription rates: United States, U. S. Possessions, and Canada, $3.00 for one year, $5.00 for two years, $6.00 for three years. All other countries, $8.00 for one year, $18.00 for three years, payable in advance in U. S. Funds.

The PAPER INDUSTRY is indexed regularly in **Engineering Index** and **Industrial Arts Index.** An index to each volume is issued annually by the publisher as a part of the April number. Copyright 1954, by Fritz Publications, Inc.

FISHER® FACTORIES

MARSHALLTOWN, IOWA

• Above—Factory No. 1. Over 255,000 sq. ft. of floor space. The industry's most modern plant. Here the world's largest production of pressure and liquid level control equipment is made possible by Fisher's unequalled research, design, engineering, testing and manufacturing facilities.

• At Left—Factory No. 2. Over 67,000 sq. ft. of floor space. A major unit in Fisher's continuing expansion program of increased facilities and production.

FISHER®

PRESSURE REGULATORS

•

GAS REGULATORS

•

LIQUID LEVEL CONTROLLERS

•

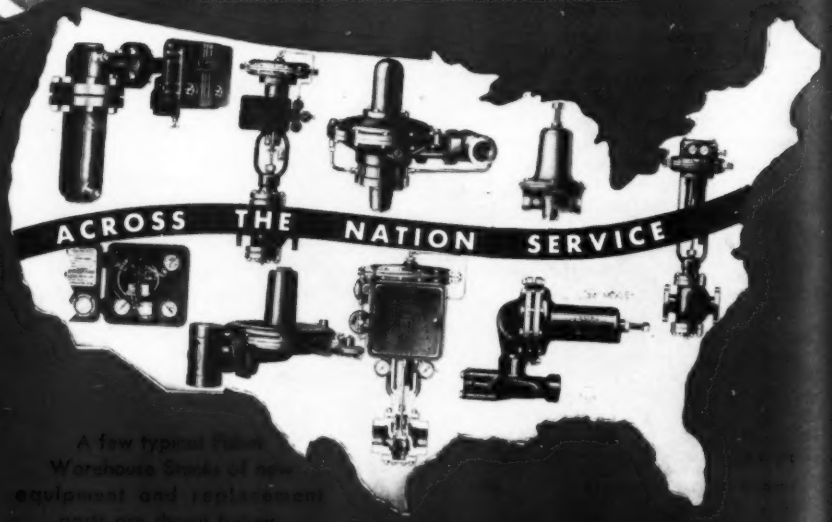
DIAPHRAGM CONTROL VALVES

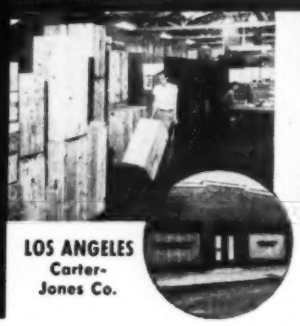
•

PUMP GOVERNORS

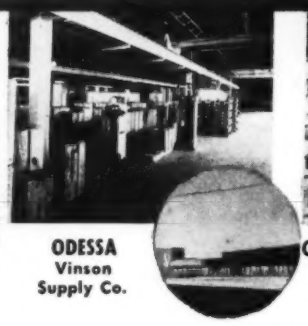
•

LEVER and FLOAT VALVES



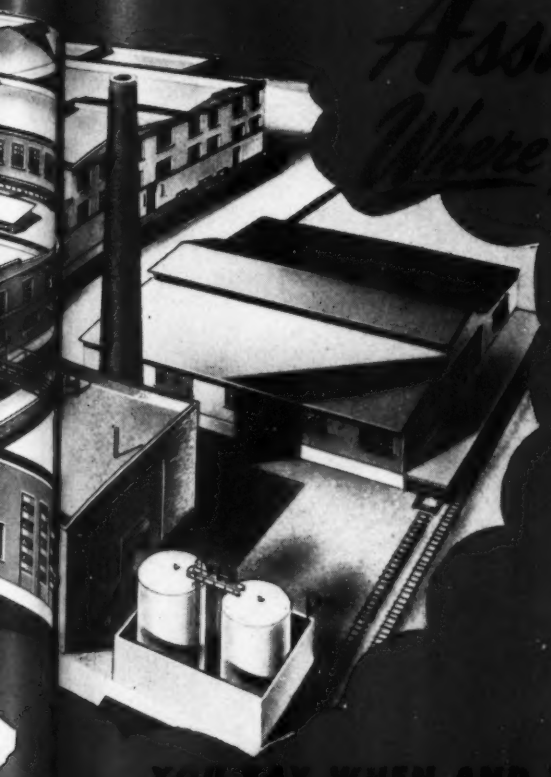


LOS ANGELES
Carter-Jones Co.



ODESSA
Vinson Supply Co.

CORPUS CHRISTI
Puffer-Sweiven Co.



Assure You Delivery

Where you want it! When you want it!

YOU SAY WHEN AND WHERE
AND WE'LL BE THERE!

You are always close to a source of supply of Fisher control valves, gas regulators, liquid level controllers and pressure regulators.

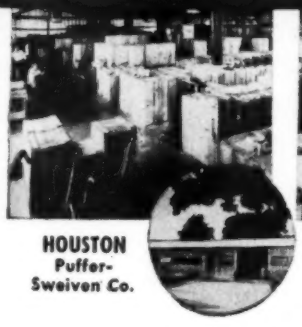
Whether your problem is one of existing equipment—or an entirely new control application—the Fisher country-wide network of 19 strategically located field stocks and 49 sales representatives—with over 200 Fisher Service Engineers—offers you immediate and convenient service on all your control requirements.

FISHER GOVERNOR COMPANY
MARSHALLTOWN, IOWA
WORLD LEADER IN RESEARCH FOR BETTER PRESSURE AND LIQUID LEVEL CONTROL

FISHER SERVICE DIRECTORY

ALBANY
Malcolm W. Black & Co.
* **AMARILLO**
Vinson Supply Co.
ATLANTA
Rittelmeyer & Co., Inc.
BALTIMORE
Rhodes Controls Co.
BIRMINGHAM
Jos. W. Eshelman & Co., Inc.
BOSTON (West Newton)
Wickersham, Petty & Co.
BUFFALO
W. J. Sommers Co.
* **CALGARY**
Barber Engineering & Supply Co.
CHARLOTTE
Robert E. Mason & Co.
CHICAGO
General Meters & Controls Co.
CINCINNATI
Harry T. Porter Co.
CLEVELAND
A. E. Ehrke & Co.
* **CORPUS CHRISTI**
Puffer-Sweiven Co.
* **DALLAS**
Vinson Supply Co.
* **DENVER**
Joy & Cox, Inc.
* **DETROIT**
DuBois-Webb Co.
HONOLULU
H. S. Gray Co.
* **HOUSTON**
Puffer-Sweiven Co.
INDIANAPOLIS
Acme Engineering Agency
KANSAS CITY
Sullivan-Mears Co.
* **LOS ANGELES**
Carter-Jones Company
LOUISVILLE
Allan K. Cook Co.
* **MARSHALLTOWN**
R. S. Stover Co.
MEMPHIS
Johnson & Scott
MILWAUKEE
Warren D. Ehrke & Co.
MINNEAPOLIS (Hopkins)
J. F. Schultz & Co.
* **MONTREAL**
Process & Steam Specialties, Inc.
MUSKEGON
DuBois-Webb Co.
NARBERTH, PA.
Clifford B. Ives & Co.
NASHVILLE
Johnson & Scott
* **NEW ORLEANS**
John H. Carter Co.
NEW YORK
Malcom W. Black & Co.
NORTH LITTLE ROCK
Johnson & Scott
* **ODESSA, TEXAS**
Vinson Supply Co.
PHOENIX
Cone & Wallace Co.
PITTSBURGH
W. A. Stoeltzing
* **PORTLAND, ORE.**
Richard H. Brown & Co.
RICHMOND
W. H. Kidd & Co.
* **SAN FRANCISCO**
George R. Friederich & Co.
SAN JUAN
F. A. Ortiz & Co.
SALT LAKE CITY
Williams, Gritton & Wilde
* **SEATTLE**
Barrett & Yost
* **SHREVEPORT**
John H. Carter Co.
* **SOUTH EDMONTON**
Barber Engineering & Supply Co.
ST. LOUIS
H. D. Hale & Co.
* **TORONTO**
George W. Beecroft Co., Ltd.
* **TULSA**
Vinson Supply Co.
VANCOUVER
Northern Columbia Process Equipment Co.
WICHITA
Sullivan-Mears Co.

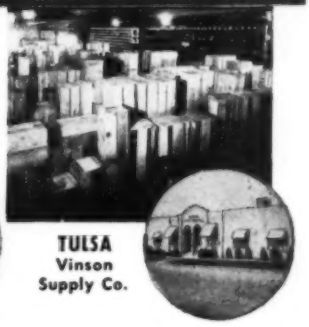
* *Indicates Field Stocks.*



HOUSTON
Puffer-Sweiven Co.

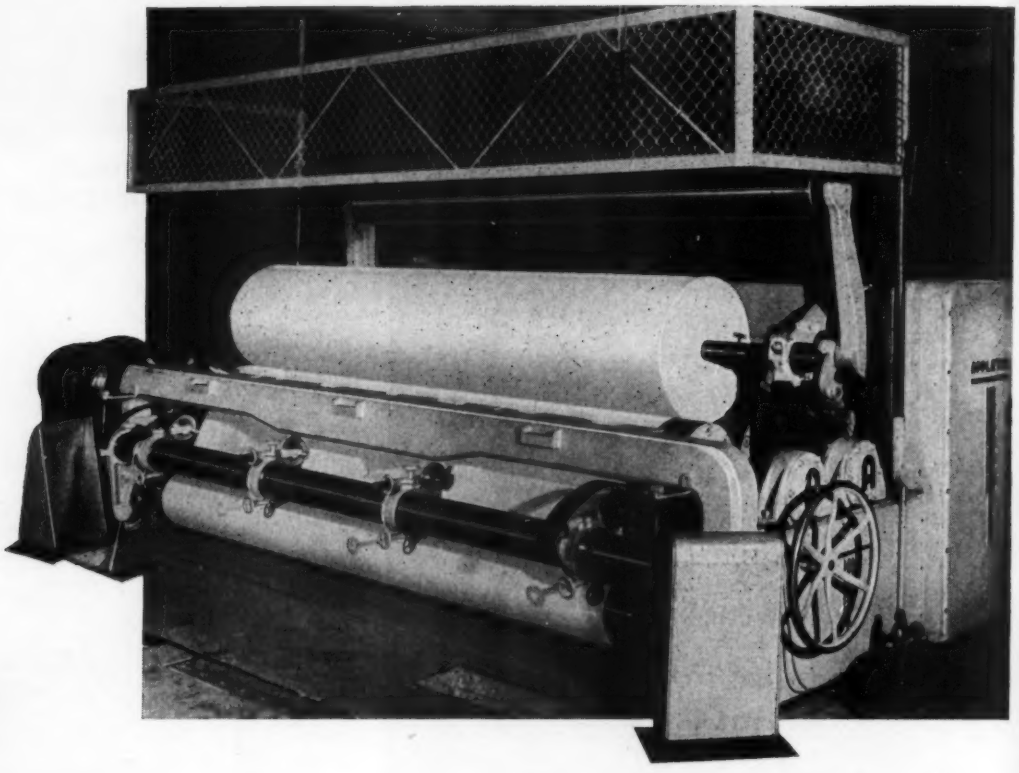
NEW ORLEANS
John H. Carter Co.

DALLAS
Vinson Supply Co.



TULSA
Vinson Supply Co.

for over 70 years...



. . . Appleton Machines have been anticipating and filling the needs of the Nation's leading paper makers. Above photograph, taken at the famed Blandin Mills, shows installation of an Appleton 150", 2 drum rewinder. Combining efficiency with stability and proven principles of pioneer design has long been our standard operating procedure.

APPLETON MACHINE COMPANY
APPLETON WISCONSIN

CUSTOM-BUILDERS OF PULP & PAPER MACHINES · WINDERS · FINISHING ROLLS · REWINDERS

YOU CAN *Specify* MINIMUM MAINTENANCE COSTS WITH *Amercoat* PROTECTIVE COATINGS

ONLY AMERCOAT PROVIDES YOU WITH

The most complete line of corrosion resistant coatings available anywhere

Field service backed by an organization SPECIALIZING in corrosion control

The service life of your equipment—the efficiency of your production schedules — the ultimate value of your investment and maintenance dollars — all are vitally dependent on the continuing performance of the protective coatings specified in your plant. Thus, success or failure of your coatings can mean the difference between tremendous losses or substantial savings.

To assure coating performance that provides long-lasting, low-cost protection, two steps are absolute essentials, right from the start. You need the right coating for each specific exposure, and it must be applied properly if it is to yield maximum benefit.

AMERCOAT ELIMINATES THE GUESSWORK—MINIMIZES MAINTENANCE COSTS

First of all, AMERCOAT provides the right coating for the particular problem. From the complete AMERCOAT line, it is possible to provide specific coatings for specific exposures to achieve specified protective performance.

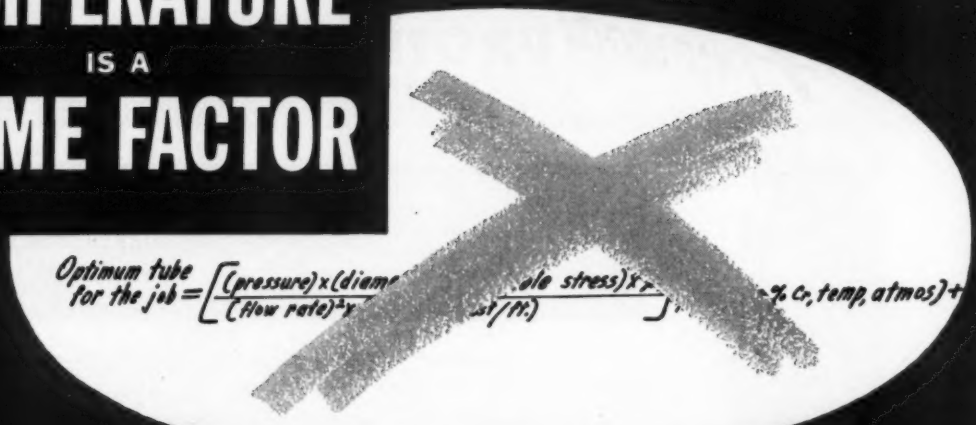
In addition, you receive the added value of AMERCOAT's conscientious service follow-through backed by an organization SPECIALIZING in industrial corrosion control. With the assistance and on-the-spot advice of a trained representative, you get the best possible application through proper attention to surface preparation and correct coating techniques.

Investigate AMERCOAT now. It's your surest way to effective, long-term corrosion control. An experienced representative is near you to serve you. For complete details write today.

Amercoat CORPORATION
4809 Firestone Blvd., South Gate, Calif.

CHICAGO, ILLINOIS
KENILWORTH, NEW JERSEY
JACKSONVILLE, FLORIDA
HOUSTON, TEXAS

WHEN TEMPERATURE IS A PRIME FACTOR



Tube Selection Cannot Be Reduced to a Formula— Even a Complicated One

Many variables are involved in the selection of the optimum tubing for a specific high temperature application. If the tubing is also to operate under high stress, perhaps the most important variable to be considered is mechanical strength.

In general, the mechanical strength of a steel decreases as the temperature increases. Some steels, however, retain more of their strength at elevated temperatures than others. For instance, at 300F, the ultimate strength of both carbon steel and B&W Croloy 18-8 (Type 304) is about 70,000 psi. At 1200F, however, carbon steel is about 12,000 psi while Croloy 18-8 is about 44,000 psi.

To evaluate the characteristics of metals operating under stress at high temperatures and over long periods of time, B&W has performed stress rupture tests and creep tests on a great number of tubing steels.* The results of these tests help engineers to determine the proper tube to be used in specific applications.

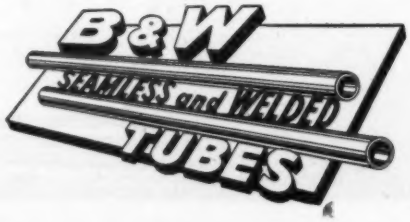
Other factors beside mechanical strength, however, must be considered in choosing the optimum tubing for a specific high temperature application. Some of these factors are—oxidation resistance, tube size, tube cost, flow rates, and rates of conductivity and expansion.

It takes an expert to specify the right tubing for any particular application, and there is no substitute for the kind of experience with these problems you'll find at B&W.

To get the most benefit from B&W's long experience in matching tubes to jobs, call on Mr. Tubes, your nearby B&W Tube Representative. He can help you make the best choice.

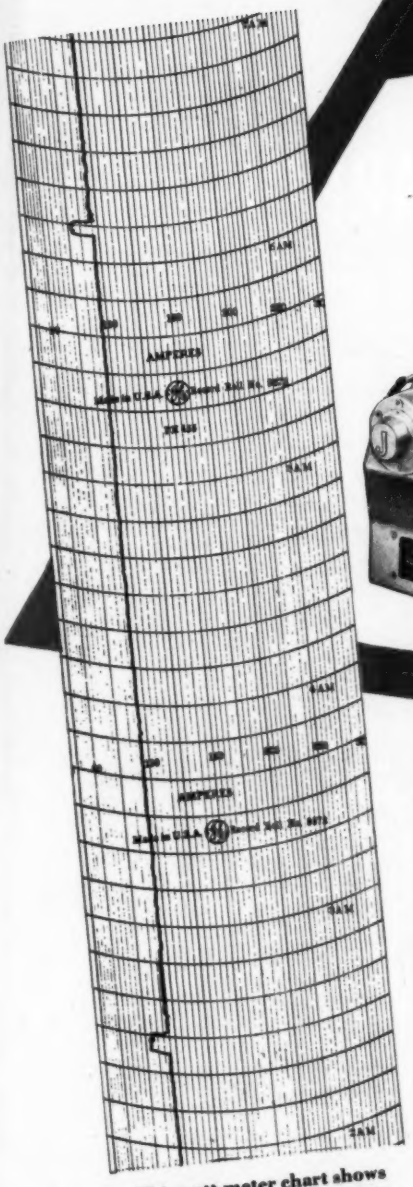
Data shown in
TDC 102 Creep Stress Data on B&W Croloys
TDC 153 Stress Rupture Data on B&W Croloys available free on request.

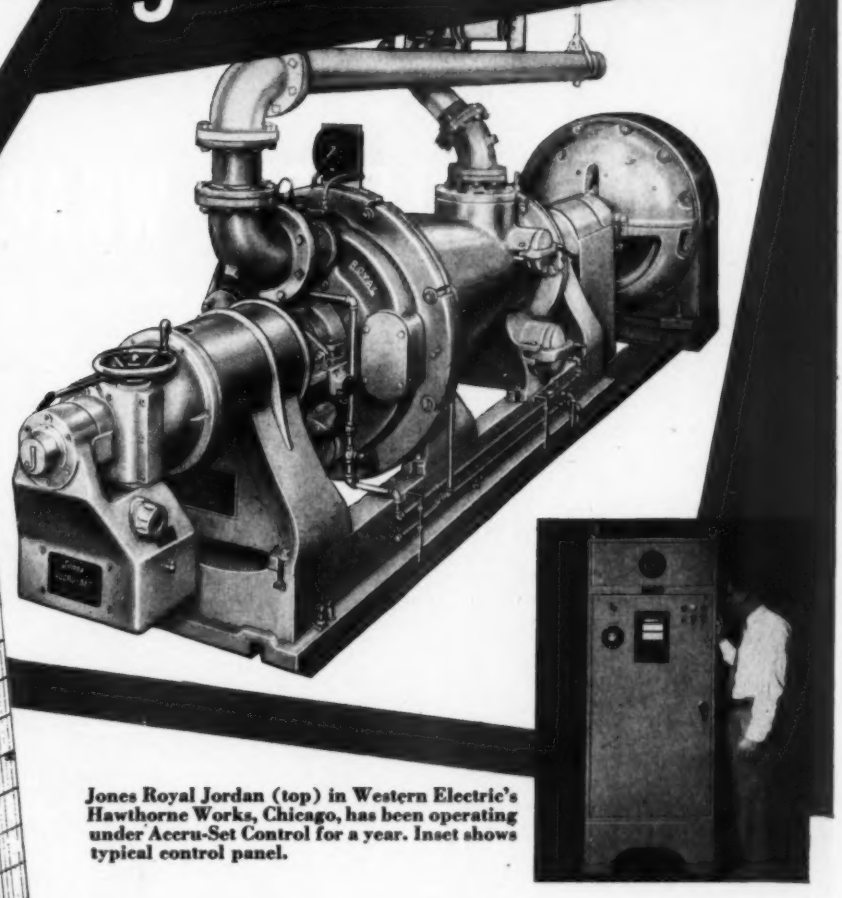
THE BABCOCK & WILCOX COMPANY
TUBULAR PRODUCTS DIVISION
Beaver Falls, Pa.—Seamless Tubing; Welded Stainless Steel Tubing
Alliance, Ohio—Welded Carbon Steel Tubing



TA-4023 (P)

ANOTHER E.D. Jones INSTALLATION





Jones Royal Jordan (top) in Western Electric's Hawthorne Works, Chicago, has been operating under Accru-Set Control for a year. Inset shows typical control panel.

This watt-meter chart shows uniformity of Jordan performance with Accru-Set Control.

ACCRU-SET® Automatic Control makes this Jordan walk a chalk-line

In mill after mill, Accru-Set has demonstrated its ability to maintain uniform performance at maximum efficiency — with a savings in operating horsepower — on every type of conical refining and Jordanning machine. Completely automatic control panel can be located anywhere; continuous record of every run permits exact duplication.

Ask your Jones representative for details or write today for our new Bulletin No. 1101.

E.D. Jones

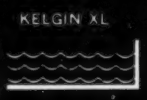
E. D. JONES & SONS CO. • PITTSFIELD, MASS.

BUILDERS OF QUALITY STOCK PREPARATION MACHINERY

REDUCE CALENDER WRAPPING

keep 'em rolling with

KELGIN XL



non-tacky surface size

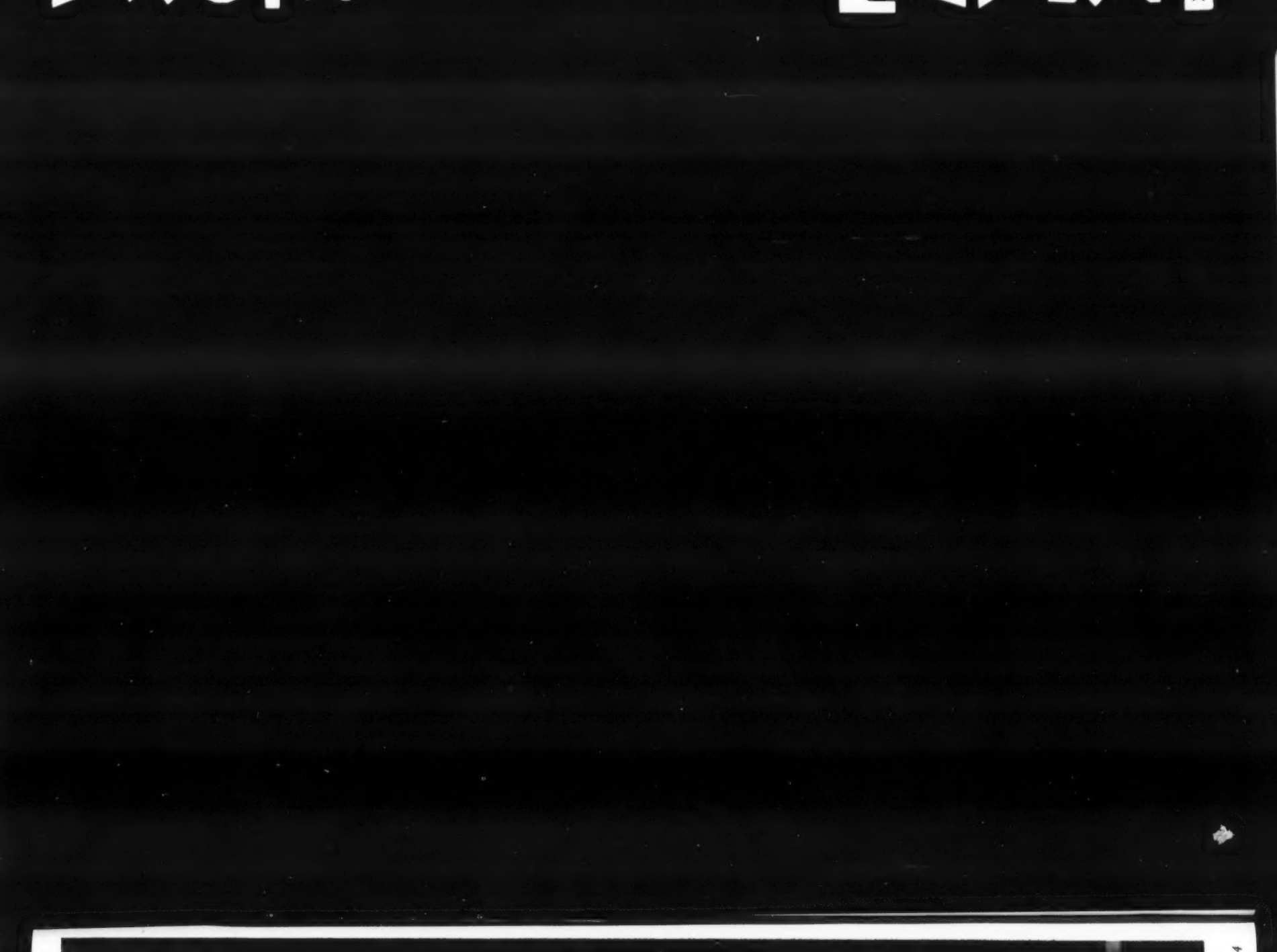
Because Kelgin XL size is non-tacky, it virtually eliminates calender wrapping. This hydrophilic colloid has excellent filming properties, produces improved smoothness, more uniform printing surface, and increased oil and varnish resistance without adverse effect on other paper qualities.

It is ordinarily applied from calender water boxes as a 1% to 3.5% solution with concentration used depending upon type and degree of finish desired.

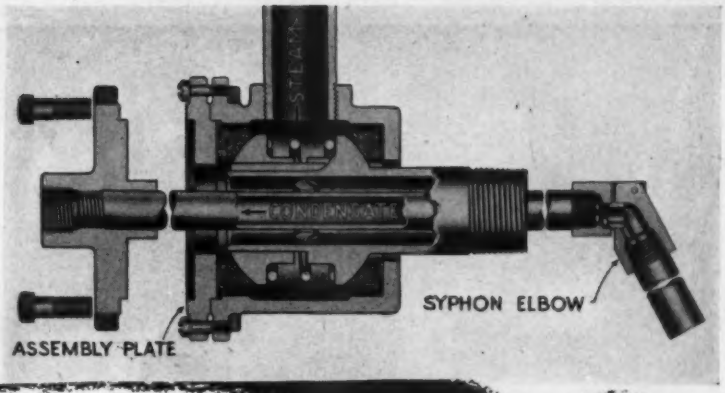
. . . a product of company

20 N. WACKER DRIVE, CHICAGO 6, ILL. 31 NASSAU ST., NEW YORK 5, N.Y. 530 W. SIXTH ST., LOS ANGELES 14, CALIF.

CABLE ADDRESS: KELCOALGIN—NEW YORK



Johnson Joint, with syphon elbow. Assembly plate holds joint mechanism in place when head is removed. Syphon pipe and elbow can be inserted or withdrawn without removing the joint body. (This can also be furnished with rods cast on body for simple rod support.)



Perfect Combinations . . .

In each of these pictures you'll see a combination of welcome new ideas that can stop a lot of operating headaches.

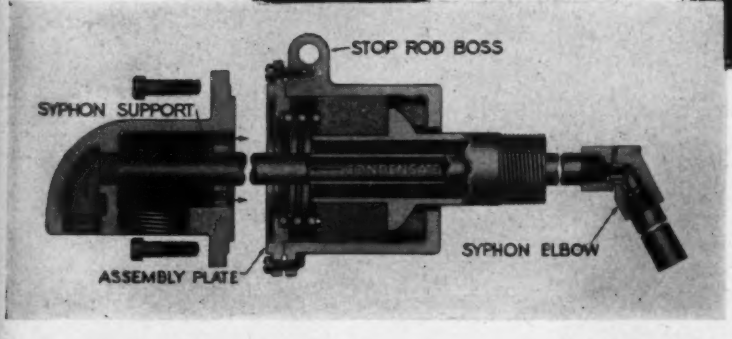
To begin with these are newly redesigned Johnson Joints. They remain completely packless, self-lubricating and self-adjusting as always. But now they are smaller size, lighter weight, with a lower price tag . . . and with wearing parts heavied up to stretch service life as much as 25%.

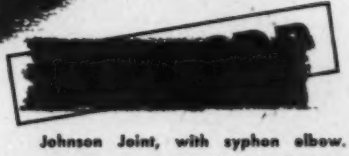
Teamed up with these is the new Johnson Syphon Elbow. It permits the use of straight pipe for syphon connection, seats itself by its own weight when in position.

Note the special assembly plate in each joint which holds internal parts in position when the head is removed. This means the syphon pipe and elbow can be inserted or withdrawn right through the joint, in many cases while the machine is operating.

JOHNSON JOINTS and the new JOHNSON SYPHON ELBOWS

Write for New Literature





Johnson Joint, with syphon elbow. This is a self-supporting design ideal for replacement use where suitable supports cannot be readily provided. Special assembly plate permits removal of head and syphon pipe without disturbing joint proper. (Same arrangement is available with Type B head, for use where steam supply is overhead.)

JC *Products of The*

845 Wood St., Three Rivers, Mich.

Rotary Pressure Joints • Compressed Air Separators and Aftercoolers
Direct Operated Solenoid Valves • "Instant" Steam Water Heaters

SMIDTH

ROTARY KILNS
FOR REBURNING LIME SLUDGE

The illustration above shows a modern, Smidth Rotary Kiln for reburning lime sludge at the plant of the West Virginia Pulp & Paper Co., Charlestony South Caroline.

F. L. Smidth & Co. are specialists in the design and manufacture of rotary kilns and have furnished numerous installations in many countries for burning lime, lime sludge, dolomite, magnesite, cement, ores, etc.

For Smidth Machinery apply to:

F. L. Smidth & Co., A/S
Vestergade 33,
Copenhagen K, Denmark

F. L. Smidth & Co.
11 West 42nd Street
New York 36, N. Y.

F. L. Smidth & Co., Ltd.,
105, Piccadilly,
London, W. 1, England

F. L. Smidth & Cie France
80 Rue Taitbout
Paris (9e) France

F. L. Smidth & Co. of Canada, Ltd.
11 West 42nd Street
New York 36, N. Y.

F. L. Smidth & Co. (Bombay) Ltd.
42 Queen's Road
Bombay, India

From pulpwood to finished rolls-- LINK-BELT helps cut paper-making costs

At this modern mill, Link-Belt conveyors are vital to the efficient handling of tons of pulpwood, chips, refuse and lime.

Take advantage of undivided responsibility for design, equipment, erection and performance of complete materials handling facilities

A typical modern paper mill uses scores of Link-Belt conveyors and drives. Logs, chips, pulp and finally rolls of paper require continuous, high-speed handling. Also systems are required to handle fuel, chemicals and waste.

For every step, Link-Belt will design the entire system . . . erect the job if desired . . . and accept complete responsibility for successful operation.

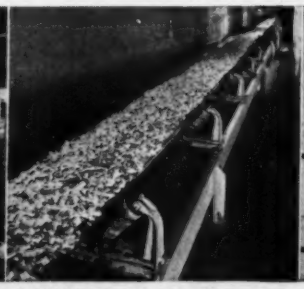
It's easy to take advantage of the experience Link-Belt has accumulated on hundreds of jobs. There are Link-Belt manufacturing plants and sales offices near every major producing area . . . providing working knowledge of regional problems. Call the one nearest you for facts on how Link-Belt's broad facilities can best serve you.

LINK-BELT

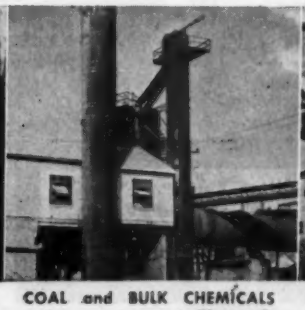
LINK-BELT COMPANY: Executive Offices, 307 N. Michigan Ave., Chicago 1. To Serve Industry There Are Link-Belt Plants and Sales Offices in All Principal Cities. Export Office, New York 7; Canada, Scarboro (Toronto 13); Australia, Marrickville, N.S.W.; South Africa, Springs. Representatives Throughout the World.

ONE SOURCE . . . ONE RESPONSIBILITY FOR MATERIALS HANDLING AND POWER TRANSMISSION MACHINERY

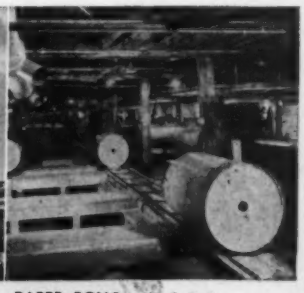
LOGS, in the wood yard, are conveyed to storage or direct to barkers and chippers by Link-Belt equipment.



CHIPS—Link-Belt feeders, conveyors, vibrating screens, handle and classify materials efficiently.



COAL and BULK CHEMICALS —For any material you get the right handling equipment from the complete Link-Belt line.



PAPER ROLLS—Link-Belt conveyors and drives coordinate product movement from machine to final shipment. 13.401

Try TRI-CLOVER

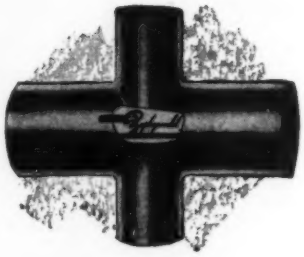
ZEPHYRWELD® WELDING FITTINGS

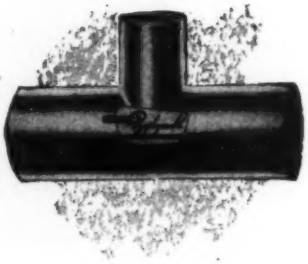
• TRI-CLOVER offers the most complete line of *Zephyrweld* Schedule 5 and 10 stainless steel welding fittings in sizes from ½" through 24" and 36" for use with stainless steel light gauge pipe. In addition, Schedule 40 fittings are available in sizes through 24".

These porosity-free fittings are fabricated from stainless steel types 304, 347, 316 and other stainless steel analyses . . and are annealed, pickled and passivated in sizes through 4". Larger sizes are passivated and may be annealed upon request.

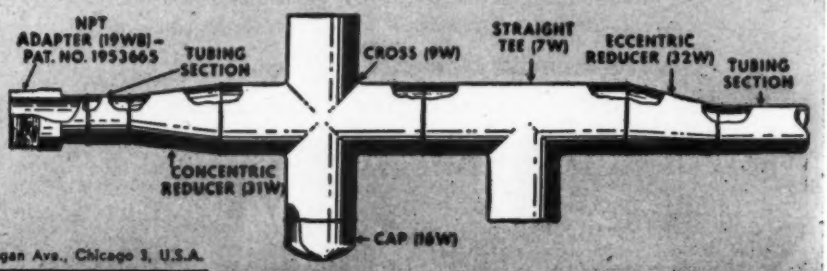
Schedule 5 and 10 fitting ends are cut flush for rapid welding. Because of their light gauge, no chamfering is required. Schedule 40 fittings are beveled in accordance with ASA specifications.

In addition to butt welding pipe fittings, Tri-Clover manufactures a complete line of stainless steel tube O.D. butt welding fittings for use with light gauge tubing.





• Shown at the right is a composite drawing showing the way in which Zephyrweld fittings are assembled, by butt welding, to light gauge pipe, or to one another. All ends are square and true—no chamfering is required to accomplish fast, clean welding. Note how Zephyrweld fittings are adapted to iron pipe size fittings through use of a special adapter.



EXPORT DIVISION: 8 So. Michigan Ave., Chicago 3, U.S.A.

Tri-Clover® MACHINE CO. Kenosha, Wisconsin

TRIALLOY AND STAINLESS STEEL SANITARY FITTINGS, VALVES, PUMPS, TUBING, SPECIALTIES

®FABRICATED STAINLESS STEEL INDUSTRIAL FITTINGS AND INDUSTRIAL PUMPS

THE Complete LINE

183-2

Our experienced engineering service is at your disposal to help solve your specific corrosion-resistant piping problems.

Write for further details, or see your nearest Tri-Clover Distributor.

IS YOUR MILL

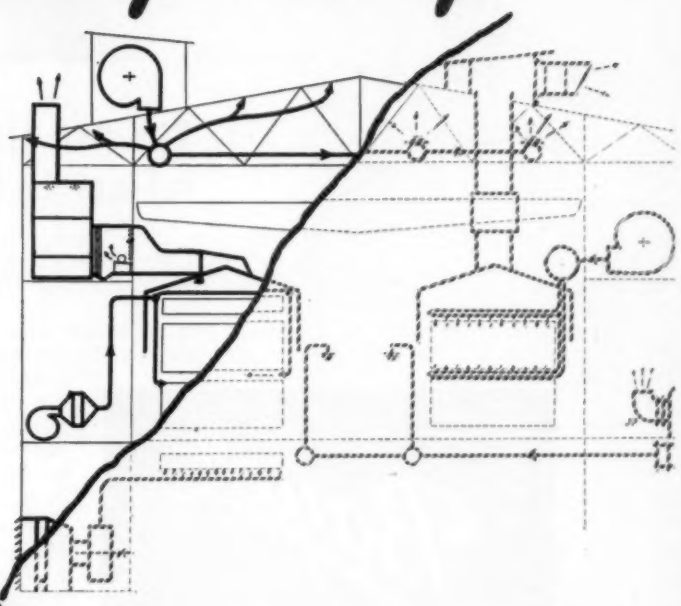
Just Limping Along

WITH ONLY

1/2

OF AN

AIR SYSTEM?



(Over 30% of the Industry's Mills Are!)

It could prove profitable for you to contact J. O. ROSS ENGINEERING CORPORATION and have an experienced engineer survey your mill to determine if the AIR SYSTEM is consistent with current production. Nowhere in the mill can you spend money with greater return than for AIR applications.

ROSS SYSTEMS

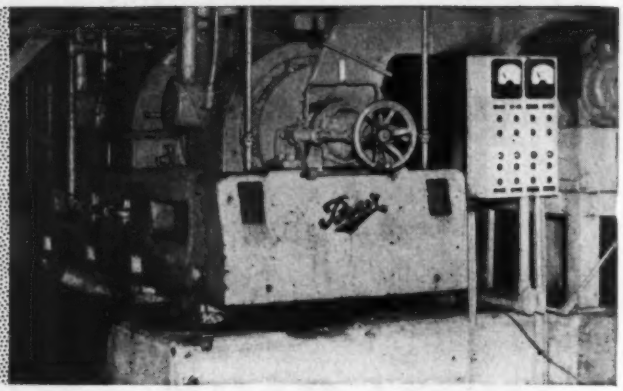
J. O. ROSS ENGINEERING CORPORATION

MANUFACTURERS OF AIR PROCESSING SYSTEMS

444 MADISON AVENUE NEW YORK 22, N. Y.

ATLANTA • BOSTON • DETROIT • CHICAGO • SEATTLE • LOS ANGELES

ROSS ENGINEERING OF CANADA, LIMITED, MONTREAL, CANADA • CARRIER-ROSS ENGINEERING COMPANY, LIMITED, LONDON, ENGLAND



You are right if your choice of refiner is based on performance

The proof of actual results is the reason for the growing usage of Bauer Disc Refiners

Bauer Double Disc Refiners produce unique fiberizing and dispersing results through brushing and rolling manipulations combined with vigorous agitation and turbulence. The effects are especially important in the refining of short fibered pulps when a paper or board of improved appearance and greater strength is required.

Bauer

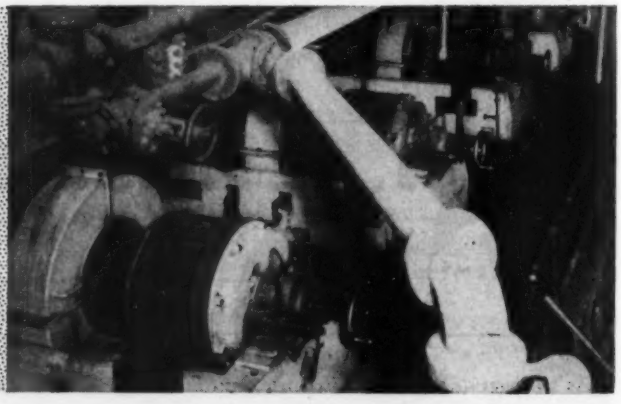
The extensive line of Bauer Single Disc Refiners has wide application for preliminary size reduction as well as final treatment of pulp stocks. Each job is an exactly engineered project in itself. There is no one refiner to do all jobs best.

We'll be glad to show you mill samples and engineering data as evidence of the work done by all Bauer Disc Refiners. In case you wish to try new materials, the Fiber Products Laboratory is at your service for test runs on commercial machines.

You are invited to communicate with us or confer with our sales engineers.

THE BAUER BROS. CO.

1759 SHERIDAN AVENUE • SPRINGFIELD, OHIO



what makes a pretty picture book?

The answer to *that* question is simple. TITANOX titanium dioxide pigments make the stock smooth and sparkling white... pictures are more vivid, even to eager young imaginations. Yes, it's TITANOX that makes a pretty picture book.

TITANOX, the original white titanium dioxide pigments, improve the appearance of quality papers when added to the beater, to the coating, or both. Legibility is improved and show-through is minimized for any given weight of stock by these easily dispersed, always uniform white pigments.

Our Technical Service Department has twenty-five years experience in servicing paper manufacturers in the best use of these pigments. Titanium Pigment Corporation, 111 Broadway, New York 6, N. Y.; Atlanta 2; Boston 6; Chicago 3; Cleveland 15; Los Angeles 22; Philadelphia 3; Pittsburgh 12; Portland 9, Ore.; San Francisco 7. In Canada: Canadian Titanium Pigments Limited, Montreal 2; Toronto 1.

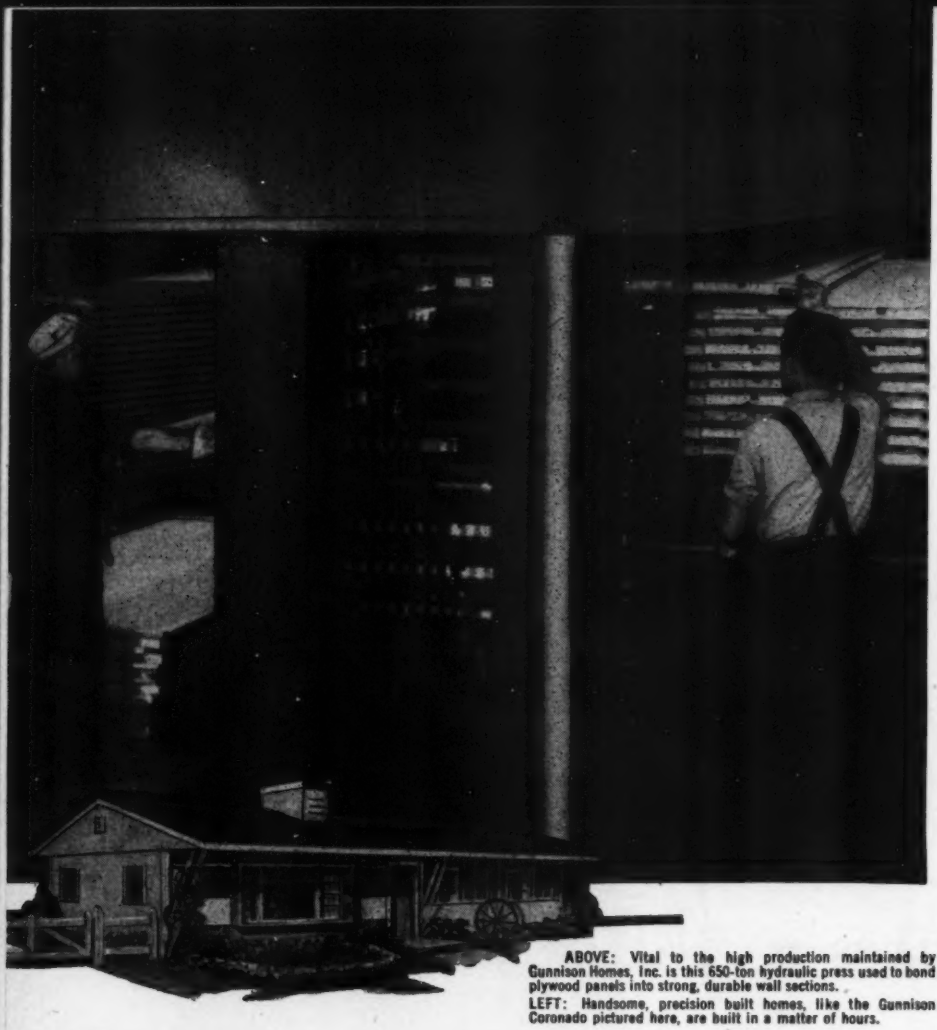
2366

® TITANOX

the brightest name in pigments

TITANIUM PIGMENT CORPORATION

Subsidiary of NATIONAL LEAD COMPANY



ABOVE: Vital to the high production maintained by Gunnison Homes, Inc. is this 650-ton hydraulic press used to bond plywood panels into strong, durable wall sections.

LEFT: Handsome, precision built homes, like the Gunnison Coronado pictured here, are built in a matter of hours.

Answers a pressing need for Gunnison Homes, Inc....

● Gunnison Homes, Inc., situated in New Albany, Indiana, is one of the leaders in the field of manufactured homes. Key to continuous production of precision built homes at the New Albany plant is the 650-ton hydraulic press, shown above, which was installed in 1947. This press processes ten plywood panels every cycle by the combination of heat and pressure . . . a tough job and one requiring reliable hydraulic performance to maintain production schedules.

STANOIL Industrial Oil was installed in the press when it was put into operation six years ago. STANOIL has stood the test of severe operation . . . with no evidence of oil deterioration being found during a recent inspection of the hydraulic system. Operation has been efficient. Minimum make-up oil has been needed to maintain the oil capacity of 450 gallons.

STANOIL
TRADE MARK
Industrial Oil

Find how STANOIL can benefit you by discussing this multi-purpose oil with a Standard lubrication specialist. You can contact him by phoning your local Standard Oil office. Or, write: Standard Oil Company, 910 S. Michigan Ave., Chicago 80, Ill.

What's YOUR problem?

Ralph E. Murnahan, of Standard Oil's Evansville office, is the lubrication specialist who keeps in constant contact with Gunnison Homes to make certain that there is no interruption of operation due to lubrication difficulties.

He is one of many lubrication specialists who make their headquarters in Standard's offices throughout the Midwest. These men have been specially trained in Standard's Lubrication Engineering Schools and, in addition, have a wealth of on-the-job experience.

To obtain the service of the lubrication specialist in your area, you need only call your local Standard Oil office. The lubrication specialist will discuss your lubrication problems with you . . . at no obligation to you, of course. He has a complete line of petroleum products to offer you, including:

SUPERLA Greases—Available in a wide range of consistency grades and in both lime-soap and soda-soap types. SUPERLA Greases cover a wide range of operations. These efficient products are comparable in quality with the highest type of special greases.

STANOLITH Greases—Because these unique lithium soap products possess the heat resistant properties of soda-soap greases and the water resistant properties of lime-soap greases, they offer a solution to lubrication problems caused by the presence of both heat and water.

STANDARD OIL COMPANY

STANDARD *(Indiana)*

from pulp to paper

ENGINEERING ASSISTANCE AT EVERY POINT

You can get sound engineering assistance at every point in your papermaking operation from Black-Clawson. From stock preparation on through the conversion of paper and board into finished products—the largest staff of specialized paper mill machinery engineers in the world is at your disposal.

Flexible and versatile, Black-Clawson engineering is based on years of actual mill experience on all papermaking processes, on all grades from condenser and tissue to the heaviest of boards. Call for Black-Clawson engineering assistance on your up-and-coming program, regardless of what it may be.

THE BLACK-CLAWSON COMPANY

HAMILTON, OHIO • MIDDLETOWN, OHIO • FULTON, N. Y.

HOOPERWOOD DRYER FELTS

Central Plant, Hooperwood Mills

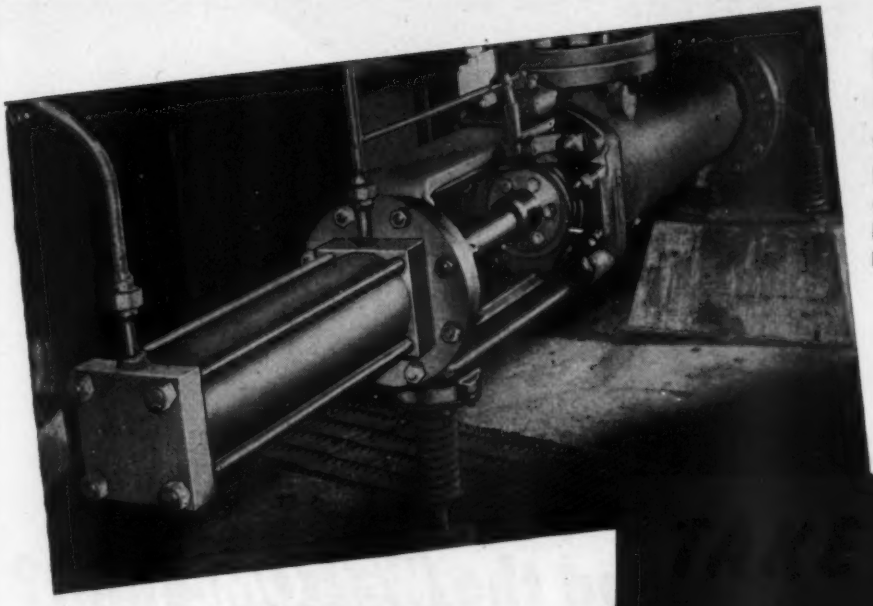
P PERFORMANCE

D DURABILITY

Q QUALITY

WM. E. HOOPER & SONS CO.

GENERAL SALES OFFICES	Juniper & Cherry Sts., Phila. 7 320 Broadway, New York 7 300 W. Adams St., Chicago 6
HOOPERWOOD MILLS	Woodberry, Baltimore 11



HYDRAULIC-OPERATED

Yarway Digester Blow Valve—one of six installed at large North Carolina paper mill.

MOTOR-OPERATED

Yarway Digester Blow Valve—one of eight installed at large Canadian paper mill.

You can choose between hydraulic-operation and motor-operation when you specify Yarway Digester Blow Valves. Both combine all the following Yarway advantages:

- Remote control, usually from above, on the operating floor.
- Tight shut-off. Effective sealing under full digester pressure. Saves cooking liquor. Insures thorough pulp cooking.
- Free discharge. No pockets. Full discharge with minimum pressure drop. Digester blows clean.
- Rugged construction. Built to withstand shock and wear of toughest service.
- Modern metallurgy—such as sliding plunger of hardened stainless steel and sleeve of chromium nickel—resists wear and chemical action.

For full details, write for Yarway Bulletin B-440.

YARNALL-WARING COMPANY
149 Mermaid Avenue • Philadelphia 18, Pa.
Branch Offices in Principal Cities

YARWAY

DIGESTER BLOW VALVES

What's beyond the WELCOME mat?

Today—every chemical producer will welcome your business. But in these days of *keen competition* and *plentiful supply*, the experienced chemical buyer looks beyond the welcome mat and the "glad hand." He goes further than a mere check of prices and specifications. In selecting a supplier he looks for the assurances and "extras" that mark the leading producer.

These Added Extras are the main reason why so many chemical buyers have for over seventy years made their first call—SOLVAY!

The World's Largest and Most Modern Alkali Production Facilities—combined with the experience of more than two generations of highly-skilled production men—are the buyers' assurance of *dependable* SOLVAY *quality*.

A Technical Service that is Different! Available to all SOLVAY customers are the facilities of SOLVAY'S *Industry-Wise* Technical Service. With separate sections for different industries, SOLVAY can offer unusual technical services not ordinarily available.

Five Manufacturing Plants that are strategically located, in addition to a nationwide chain of over 200 local distribution centers, assure SOLVAY customers quick, efficient deliveries—whether they order a bag or in multiple carloads.

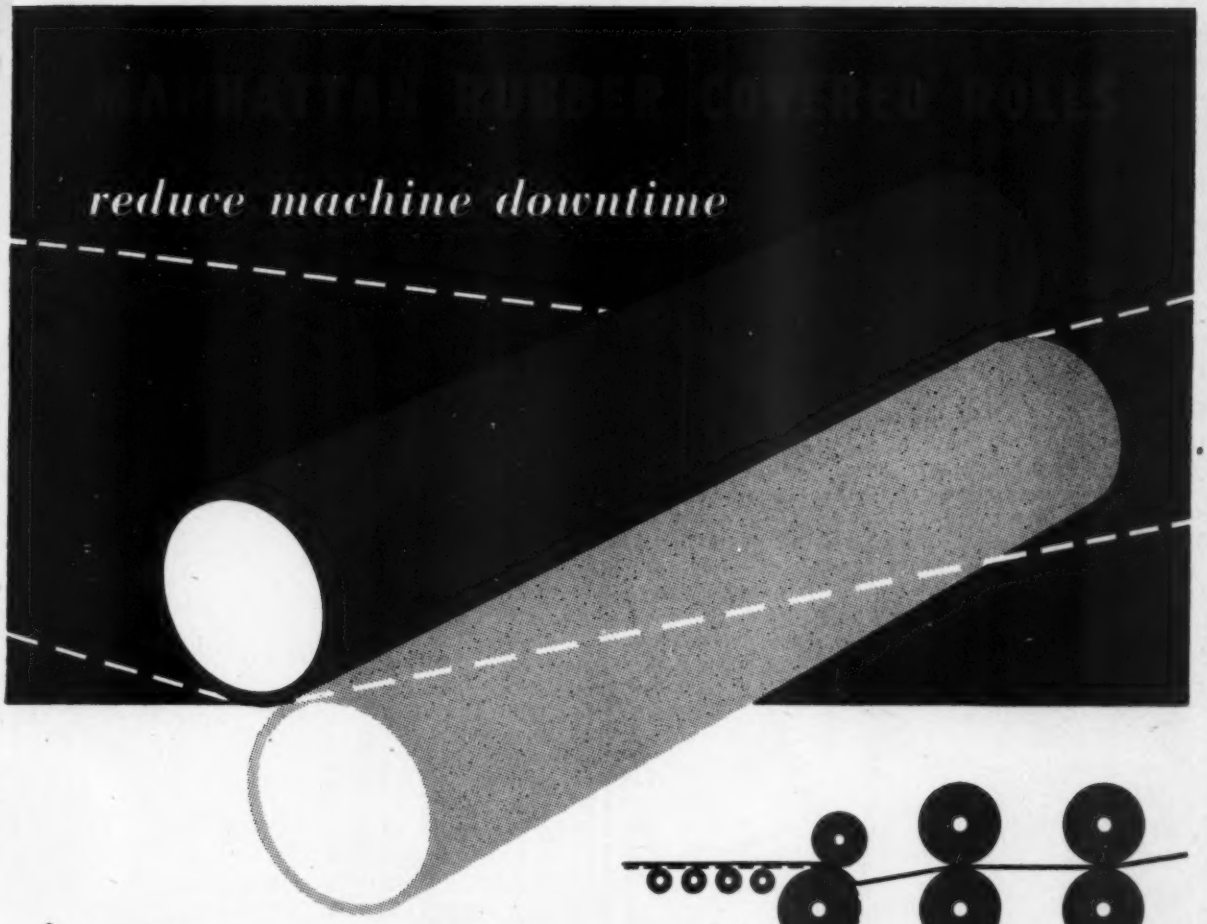
Buyers' Needs and Problems are handled by SOLVAY'S trained and experienced *local* field representatives who operate out of SOLVAY'S 13 branch offices.

For Top Quality Plus Other Extra Services that help you meet today's competitive conditions—be sure to *specify* SOLVAY!

SOLVAY

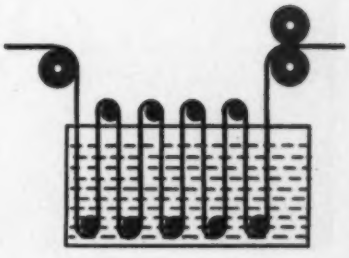
Soda Ash • Snowflake® Crystals • Potassium Carbonate • Calcium Chloride
Sodium Bicarbonate • Ammonium Bicarbonate • Cleaning Compounds
Caustic Potash • Sodium Nitrite • Ammonium Chloride • Chlorine • Caustic
Soda • Monochlorobenzene • Para-dichlorobenzene • Ortho-dichlorobenzene

SOLVAY PROCESS DIVISION
ALLIED CHEMICAL & DYE CORPORATION
61 Broadway, New York 6, N. Y.
BRANCH SALES OFFICES:
Boston • Charlotte • Chicago • Cincinnati • Cleveland • Detroit • Houston
New Orleans • New York • Philadelphia • Pittsburgh • St. Louis • Syracuse



give you

more use per dollar



Cracking, hardening, corrugation, or separation of rubber from the metal roll core all spell "trouble" for rubber roll coverings . . . and losses in production, quality and schedules. Manhattan roll specialists have eliminated these causes of expensive machine downtime to give you "More Use per Dollar" with Manhattan Rubber Covered Rolls. They have developed an inseparable bond of rubber to metal. They custom-tailor rubber roll covering to meet your specific requirements. You get permanent uniform and correct density and uninterrupted high speed production runs under all working conditions. Discuss your operating requirements with an R/M roll engineer.

ROLL COVERING PLANTS AT PASSAIC, N. J. — NEENAH, WIS. — NORTH CHARLESTON, S. C.

MANHATTAN RUBBER DIVISION — PASSAIC, NEW JERSEY

RAYBESTOS-MANHATTAN, INC.

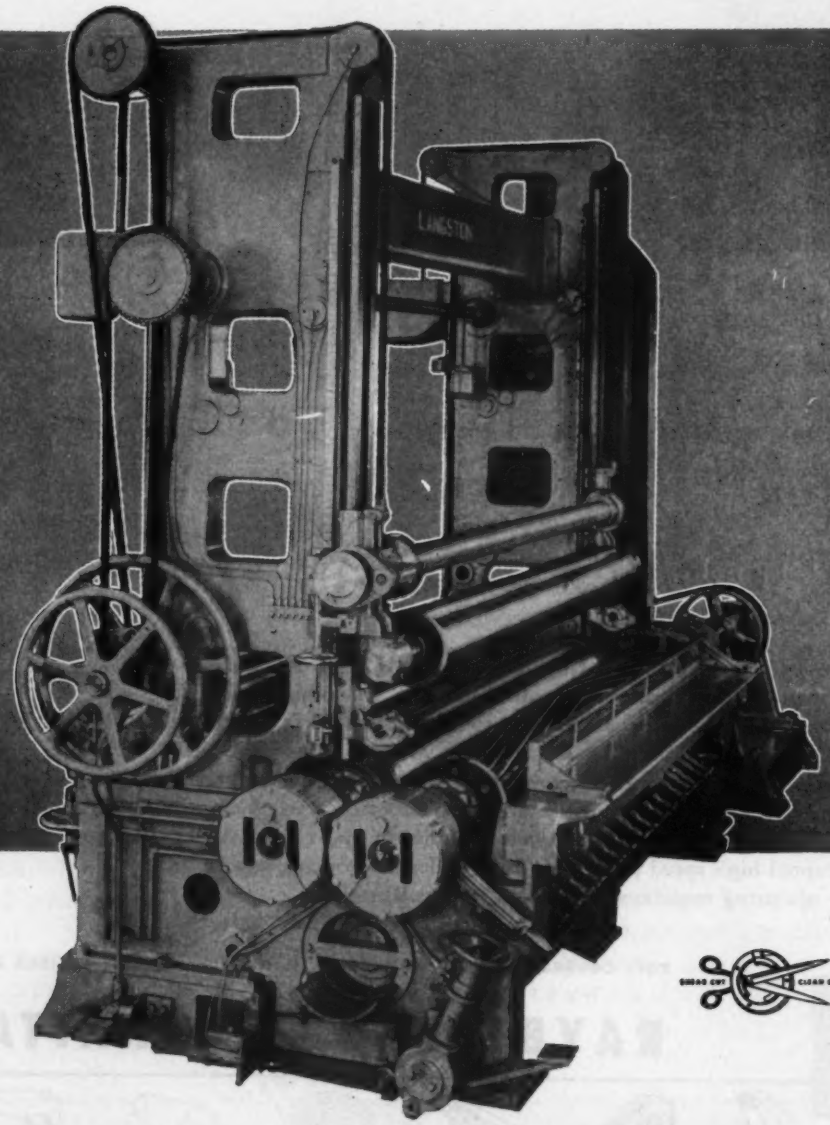
Other R/M products include: Industrial Rubber • Fan Belts • Radiator Hose • Brake Linings • Brake Blocks • Clutch Facings
Asbestos Textiles • Packings • Engineered Plastic, and Sintered Metal Products • Bowling Balls

RM 421

LANGSTON SLITTERS AND WINDERS

Main winding drums, power driven slitter shaft, idlers and top pressure or riding roll are statically and dynamically balanced for high speed performance. In addition, the winding drums are equipped with hydraulic brakes so that the machine can be brought to a smooth and rapid halt at the end of each roll.

For highest quality rolls with minimum upkeep—specify Langston.



SHEAR CUT CLEAN CUT

SAMUEL M. LANGSTON COMPANY

CAMDEN 4, NEW JERSEY

When Papermaking Was the Newest Industry Under the Sun...

In the second century after Christ, when papermaking was in its infancy, macerated fibers in liquid form were poured on cloth moulds and placed in the sun to dry. The fiber was stripped from the mould after it was completely dry . . . and thus a sheet of paper was made. In America, modern high-speed machines have taken the place of ancient papermaking methods. And for more than 30 years A. E. Staley Manufacturing Company has served the progressive American paper industry, supplying high-grade raw materials to the nation's leading mills. Staley products and expert assistance can improve *your* business. Contact your supplier or write direct for details.

Quality Staley Products for Papermakers

Staley Sizing Starches
A full range of starches and dextrins for beater, surface or calender sizing.

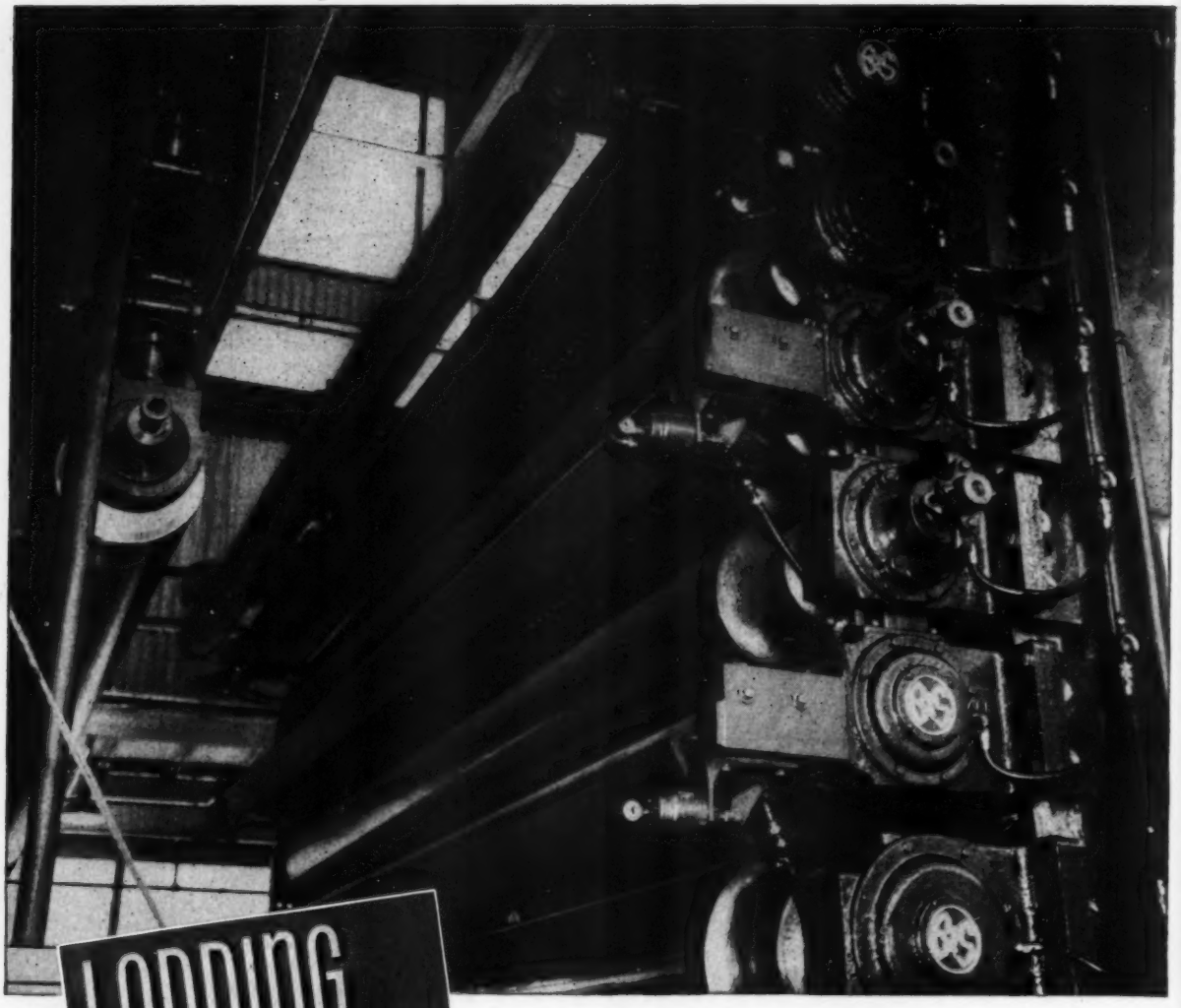
Staley Corrugating and Laminating Adhesives
Corrugating starches, special laminating and bag adhesives.

Staley Coating Adhesives
Starches and Dextrins give better results for machine or regular brush coating.

Staley Plasticizers
"Sweetose" and Staley's corn syrup are ideal softening agents for glassine paper.

PRODUCTS FROM CORN
Staley's

A. E. Staley Mfg. Company, Decatur, Ill.



LODDING DOCTORS

MODERN Calender Doctors

hydraulically oscillated with pneumatic loading

LODDING ENGINEERING CORPORATION

WORCESTER, MASSACHUSETTS

REPRESENTED BY

W. E. GREENE CORPORATION • WOOLWORTH BLDG., NEW YORK

"You see POWELL VALVES everywhere!"

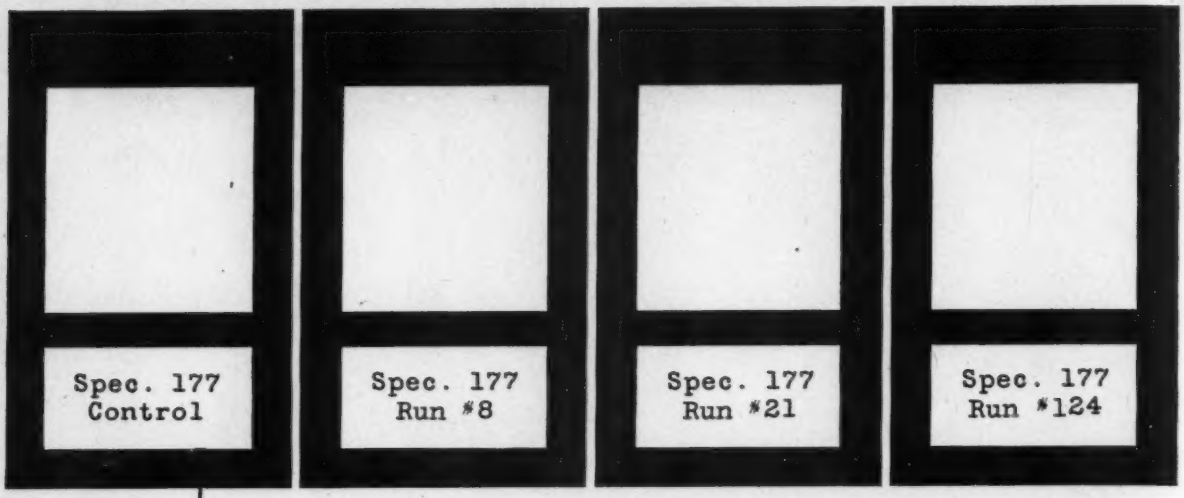
And no wonder! For The William Powell Company makes more kinds of valves and has probably solved more valve problems than any other organization in the world.

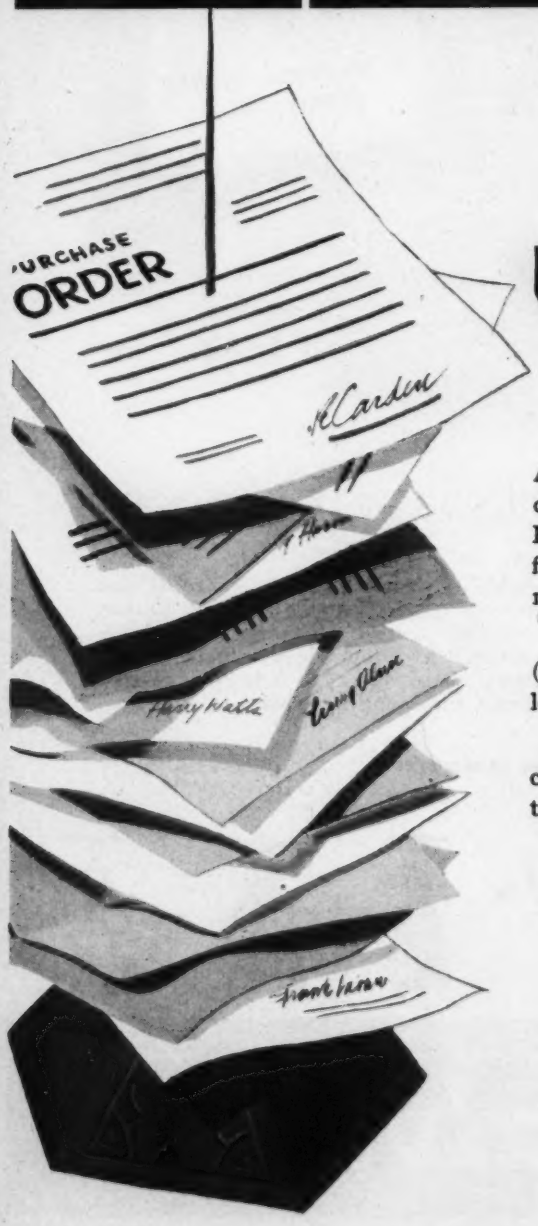
Wherever flow requires dependable control, there's the place for Powell Valves—famous for dependability since 1846. Made ⅛" to 30" and 125 pounds to 2500 pounds W. S. P. Bronze, iron, steel and corrosion resistant alloys. Available through distributors in principal cities. On problems, write direct to The Wm. Powell Company, Cincinnati 22, Ohio.

CONTROLS FOR THE LIFE LINES OF INDUSTRY

Powell Valves

108th year





For repeat orders, develop

PRODUCT UNIFORMITY

with EAGLE® Corn Starch

A competitively-priced board with a uniform, durable printing surface gets repeat orders. Eagle Brand Corn Starch assures you of an improved finish and a better printing surface, which will resist scuffing.

Paper men recommend Eagle Corn Starch (an acid-converted starch) for its ease of cooking, low cold water solubility and low viscosity.

No matter how unique and or rigid your specifications, Eagle starches meet them. For a complete technical demonstration, please get in touch with

Corn Products Refining Company
17 Battery Place, New York 4, N. Y.

EAGLE
BRAND
acid-converted
CORN STARCH

Over 750 Installations
in 22 Countries
Throughout the World

Morden-ize

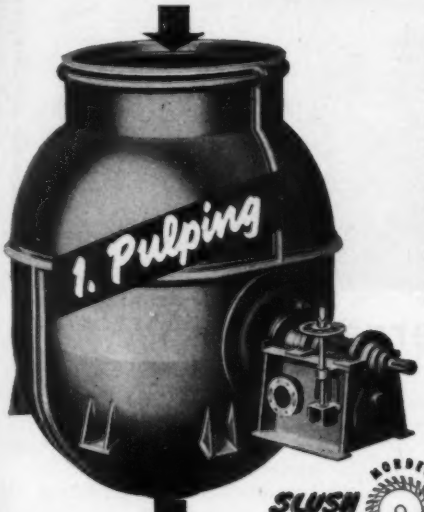
THE 3 BASIC TREATMENTS IN YOUR STOCK PREPARATION

EACH STOCK requires one or more of these basic treatments.

EACH MORDEN MACHINE is engineered, standardized and proven in one of these basic treatments.

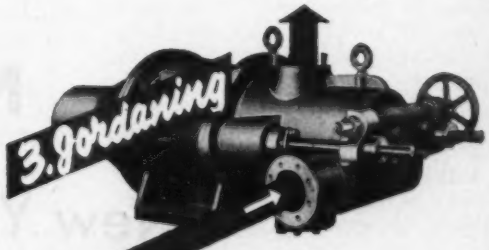
EACH MILL'S requirements suggest various applications.

OUR EXPERIENCE in assisting mills to develop simple, effective and economical stock preparation systems is available to you upon request.



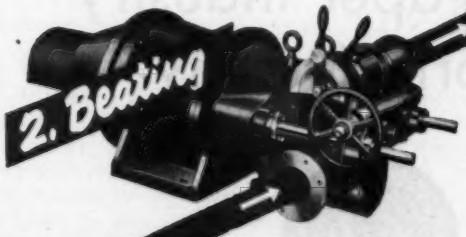
MORDEN SLUSH MAKER®

...for completely defibering all pulps, papers and brokes (even wet strength) without auxiliary equipment.



MORDEN STUFF MAKER

... for cutting or shortening where required to obtain specific sheet properties.



MORDEN STOCK MAKER®

...for brushing, fibrillating and hydrating individual fibers for maximum strength development.

MORDEN
STOCK PREPARATION EQUIPMENT
MACHINES COMPANY

CORBETT BUILDING PORTLAND, OREGON

Northeastern States Representatives:
ORTON CORPORATION, Fitchburg, Massachusetts

Midwestern States Representatives:
DAN B. CHAPMAN, Appleton, Wisconsin

Other Representatives in most paper-making countries.

ANOTHER VANDERBILT PRODUCT

Gouverneur Talc Co., Gouverneur N. Y.

NYTAL

New York State Talc
for the Paper Industry
—Uniform Quality—

R. T. VANDERBILT CO. INC.

230 Park Avenue, New York 17, N. Y.

The Paper Industry Current Comment

Inspiration to optimists . . . good salesmanship . . . and improved tone

The gloomsters foreseeing difficult business times during 1954 have been blanketed as far as the paper industry is concerned by recent developments. Forecasts made at the APPA convention in February saw a production drop of not over 7 to 10 per cent from the 1953 record, but the first quarter is leaving even these predictions on a somewhat weakened limb.

Two conventions, however, brought inspiration to the optimists — the National Paper Trade Association meeting, and that of the Waste Material Dealers, who supply the industry with much of the raw material for the board division.

The merchants (NPTA) were told by various speakers that all that is needed to maintain a high record of sales is good salesmanship. The waste material dealers were given optimistic forecasts of the future and a talk on the success of the mills in properly utilizing their collections of waste paper.

At the merchants convention Dr. S. H. Slichter of the Harvard School of Business Administration told the 1,000 in attendance that there should be good times for the next 10 years and foretold a definite business pick-up between July 4 and Labor Day. John R. Kimberly, executive vice president of Kimberly-Clark Corp. and vice president of the American Paper & Pulp Association, said merchants and manufacturers by working together can perform a wholesaling service that adds a plus value to the product when it reaches the customer. The same need of cooperation between merchants and producers was emphasized at the panel meetings of the wrapping and fine paper divisions, when outstanding manufacturers and leading merchants participated in across-the-table discussions.

An upward turning

At the meeting of the national waste material dealers, Jacob Baker of the Econometric Institute elaborated on the optimistic views expressed at an earlier meeting by Dr. Charles F. Roos, president of the Institute. Mr. Baker said that 1953 marked an upward turning point in the American economy. He estimated that waste paper requirements in 1954 will total about 8 million tons. The demand will depend on the level of activity in end-use industries and the rate of growth in end-use industries. While he anticipated heavy usage, he also felt that the supply would meet the demand.

At the same convention Joseph H. Miller of New Haven Board & Carton Co. told of the development of higher types of paperboards, which in return require a better quality of raw material. With this trend, he said, the waste material dealers must be ready to cooperate by providing the grades of waste paper which will be demanded for the future production of paperboards of a far higher grade than those now accepted by the customers.

Meanwhile, the tone of the manufacturing industry has improved rapidly. The stock market prices of the month are an example of the way in which the investing public looks at the industry, and in nearly every instance the market prices of paper mill securities have increased by a goodly percentage in the past few weeks.

At Washington, the Congressional picture has seen efforts to complete as much as possible of the Eisenhower program before the contemplated adjournment in July. The members of both houses are anxious to establish a record of accomplishment which they can take to their constituents in the election campaign, culminating in the selection of a new Congress in November. The President has tried to mollify the fears of those opposing his program for broadening foreign trade by eliminating the so-called trade barriers of the domestic tariff law. He says he realizes that, while some industrial adjustments will be necessary, the Government will be vigilant to see that unjustified damage does not result from an expansion of imports.

Foreign costs low

A survey of foreign trade in the paper field indicates that while imports increased materially (about 60 per cent in volume) during 1953 as compared with 1952, exports have steadily fallen off. Any talk of improving the export trade in paper by reducing American tariff rates is discounted by the inability of American manufacturers to meet the low-cost operations of foreign mills. In some grades the drop in exports has been as much as 50 per cent in dollar value. American production costs do not seem to facilitate foreign trade on the export side of the ledger. In other words, a gain in dollars earned by foreign manufacturers of paper through sales in this market is spent in buying the products of other industries.

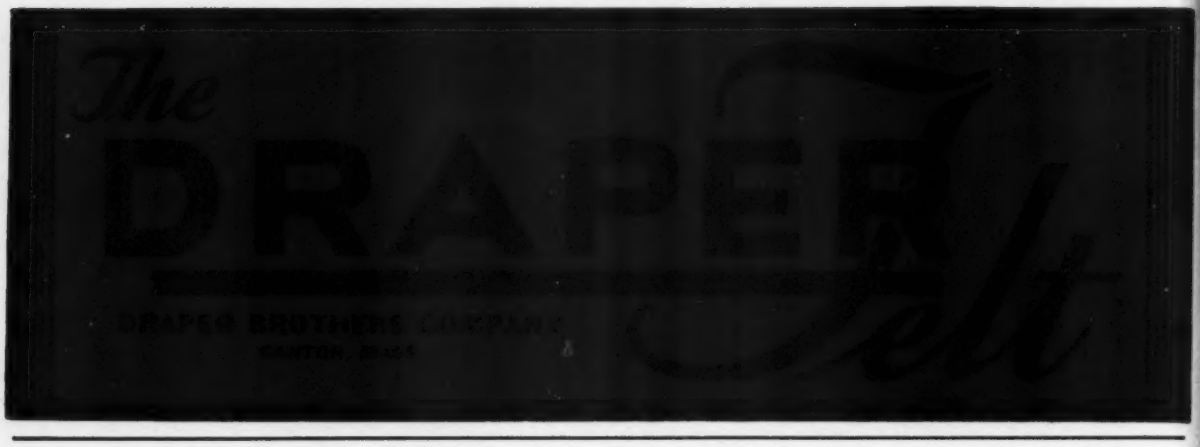
The urge to spend American money abroad for the upbuilding of foreign paper mills continues. The Foreign Operations Administration has announced the following authorizations of procurement, through United States loans: United Kingdom, $1,500,000 for dissolving pulp and container board liners; Formosa, $250,000 for pulp, paper and paper products to be supplied by the United States and European countries.

Financial Reports

The securities markets in the past month have seen a rise in over-all prices to the highest average in many years. The increase applied to practically all industries, and the paper industry shared in the general advance.

Net incomes

American Box Board Co.—Net income for the year ended November 30 was $1,472,671, as compared to $1,466,664 for 1952.



Anglo-Canadian Pulp & Paper Mills Ltd.—Net 1953 profit was $3,396,761, as compared to $2,152,554 for 1952.

A. P. W. Products Co.—Deficit in 1953 was $214,724, as compared to 1952's deficit of $43,307.

Bird & Son inc.—Net income for 1953 was $2,045,735, as compared to 1952's $1,597,111.

Celotex Corp.—Net income for three months ended January 31 was $315,489, as compared to $502,552 for the same period a year ago.

Consolidated Paper Corp. Ltd.—Income from all sources for 1953 was $95,855,552, as compared to $94,880,759 in 1952.

Container Corp. of America—Net earnings for three months ended March 31 were $4,255,000, as compared to $2,429,000 in 1953.

Continental Diamond Fibre Co.—Net 1953 income was $826,725, as against $789,814 in 1952.

Dixie Cup Co.—Net 1953 income was $2,751,752, as compared to $2,302,789 in 1952.

Eddy Paper Co. Ltd.—Consolidated net income for 1953 was $862,161, as compared to $782,184 in 1952.

Gair Co., Robert—Net income for 1953 was $6,451,541, compared with $5,800,122 in 1952.

Gaylord Container Corp.—Net 1953 income was $7,795,782, as compared with $8,116,660 in 1952.

Great Northern Paper Co.—Net income for 1953 was $4,625,785, as compared with $4,638,949 in 1952.

Hammermill Paper Co.—Net income for the year ended December 31 was $1,541,398, as against $1,208,200 in 1952.

International Paper Co.—1953 profit was $63,935,478, as against $52,125,952 in 1952.

Kimberly-Clark Corp.—Net income for the 12 months ended January 31 was $10,404,381, as compared with $8,739,151 in the previous fiscal year.

Marathon Corp.—Net income for the three months ended January 31 was $1,268,356, as compared with $1,257,302 in the same period a year ago.

Minnesota & Ontario Paper Co.—Net income for 1953 was $5,687,358, as compared with $5,218,263 in 1952.

National Container Corp.—Net 1953 income was $3,450,000, as compared with $3,811,945 in 1952.

National Gypsum Co.—Earnings for 1953 were $7,821, 323, as compared with 1952's $7,249,480.

Nekoosa-Edwards Paper Co.—1953 profit was $1,583,475, down 10.9 per cent from 1952.

Oswego Falls Corp.—Net income in 1953 was $1,523,353, as compared with $1,096,072 in 1952.

Oxford Paper Co.—Net 1953 income was $2,709,299, as compared with $2,666,631 in 1952.

Price Bros. & Co.—Net profit for 1953 was $6,068,531, compared to the 1952 net of $6,055,588.

Puget Sound Pulp & Timber Co.—Net income for 1953 was $2,889,582, as compared with $2,831,653 a year before.

River Raisin Paper Co.—Net earnings for 1953 were $720,847, as against $615,388 for 1952.

St. Croix Paper Co.—Net income for 1953 was $986,512, as compared with $882,314 the year before.

Scott Paper Co.—Net 1953 income was $11,695,383, as compared with $10,707,346 in 1952.

Southland Paper Mills—Net income for 1953 was $3,233,146, as against $2,999,122 in 1952.

Paper mill corporate changes

Canadian Chemical & Cellulose Co. is taking the first step toward more permanent financing of its outstanding short-term borrowings. Shareholders were to meet April 21 to approve a by-law creating a $10,000,000 issue of preferred stock. The new $100 stock would be offered in settlement of the firm's loan of $10,000.000 (U. S.) from Celatino, S. A., owner of 80 per cent of Canadian Chemical & Cellulose's outstanding common.

Canadian International Paper Co. is taking up the common and preferred shares of Commercial Alcohols Ltd., deposited under an offer to purchase at the rate of $4 for common and $6.50 for preferred.

Consolidated Paper Corp.'s first secondary offering (through Michigan Corp. and associates) of 50,000 common shares was oversubscribed. The $10 par stock was offered at 23¾.

International Paper Co.—at the annual meeting on May 12—was to propose an extension of its stock option plan for key employees to include officers and employees of Canadian and other foreign subsidiaries.

National Vulcanized Fibre Co. of Wilmington, Del., has acquired Marshall Bros. of Yorklyn as a wholly owned subsidiary through acquisition of all the outstanding Marshall stock.

United Board & Carton Co. has negotiated a loan of $2,000,000 from three banks to finance the acquisition of Densen Banner Co. and Densen Realty Co.

Stock and Bond Quotations

New York Stock Exchange — Stocks

Closing Prices	April 9, 1954	March 10,1954
A.P.W.	2⅞	3⅛
Celotex	18⅞	18⅝
Same Preferred	17	16¾
Certain-teed	15⅝	14⅞
Champion P & F	36½	35½
Same Preferred	103½	*105½
Chesapeake Corp.	30¼	*28-28½
Container Corp.	54	47
Same Preferred	102	*101¾-102
Continental Diamond	11¼	11¼
Crown Zellerbach	42⅛	41
Same Preferred	104¾	103¼
Dixie Cup	52½	47
Eastern Corp.	16¼	*17-17⅜
Robert Gair	23⅛	22⅝
Gaylord Container	28½	26¼
Great Northern P	61	59
Hammermill	16	14⅜
International P	64⅝	60⅜
Same Preferred	105	104¾
Kimberly Clark	59¼	52¾
Same Preferred	118	111
MacAndrews & Forbes	41½	44⅝
Marathon	21⅜	20½
Masonite	19¾	18¾
Mead Corp.	32⅜	31½
Same Preferred	98½	*94½-95
National Container	11	11
Same Preferred	22	21⅝
Rayonier Inc.	33	30⅝
Same Preferred	35¼	34½
Scott Paper	84½	76
Same $3.40 Pref.	93½	94
Same $4.00 Pref.	103	*104-105½
St. Regis Paper	24	22¾
Same Preferred	98½	98
Sutherland Paper	37	37½
Same Preferred	128	130
Union Bag & Paper	49	46⅜
United B & C	15⅛	*14⅞-15
United Wallpaper	1⅝	1¾
Same Preferred	16¾	16
U.S. Gypsum	134½	125½
Same Preferred	179½	178
West V P & P	28⅝	29¼
Same Preferred	107½	*108-109

New York Stock Exchange — Bonds

Celotex 3½%	..	..
Champion P & F 3%	99¾	..
Mead Corp. 3%	..	..

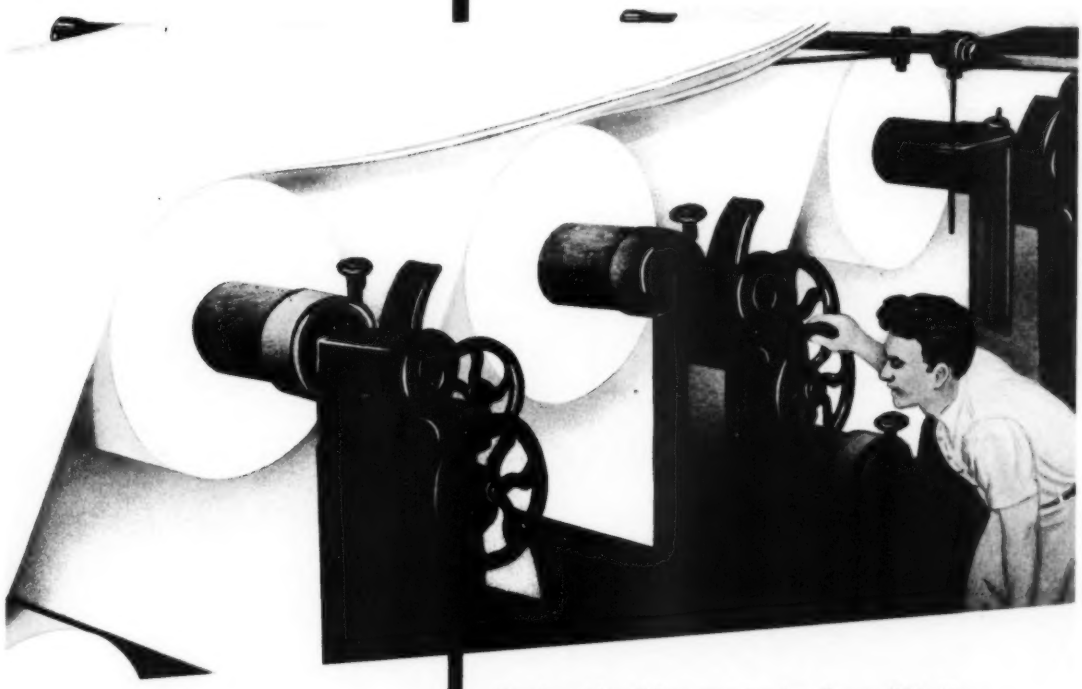
American Stock Exchange — Stocks

American Writing	13	12
Brown Co. Common	12	10⅞
Same $5 Preferred	99	97½
Same $3 Preferred	52½	51⅞
Puget Sound	34⅝	33¾

*Closing Bid and Asked Prices.

How YOU can profit by OUR experience

Over the years, we have noticed that mills with complete color lines can usually keep paper-making machines operating profitably when adequate tonnage on more competitive lines is hard to get. We have helped many of these mills to get started on colored paper and board specialties.



NATIONAL PAPER DYES

Running colored lines now involves fewer difficulties than you may suspect. With the proper formulas and methods, they can be quite profitable indeed. From first hand experience, National Aniline paper technicians well understand the aspects of making colored lines. They can provide very practical help on formulas and application methods. This is part of our comprehensive service to paper mills. We invite you to use it.

NATIONAL ANILINE DIVISION ALLIED CHEMICAL & DYE CORPORATION 40 Rector Street, New York 6, N. Y.

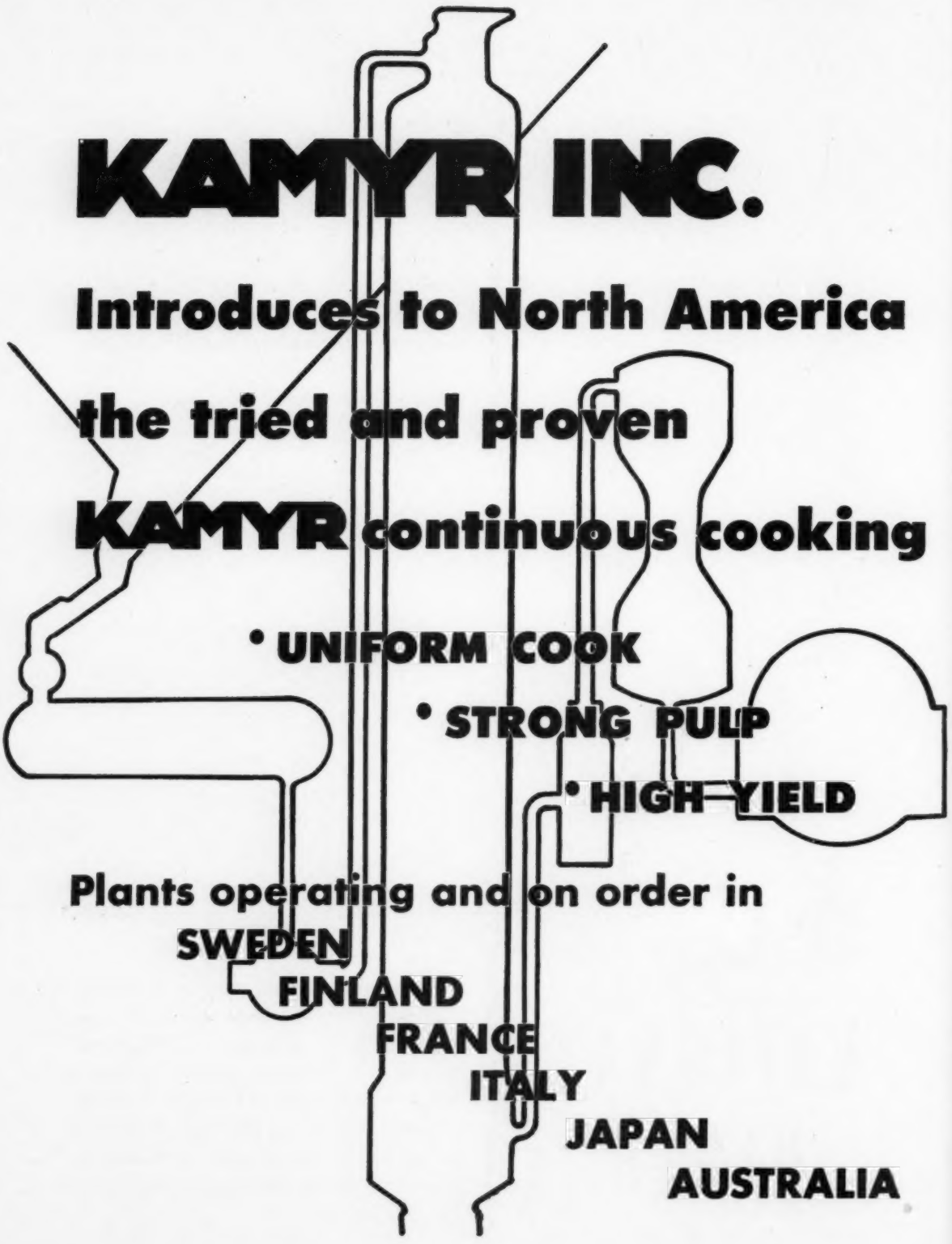
BOSTON PROVIDENCE PHILADELPHIA CHICAGO SAN FRANCISCO PORTLAND, ORE. GREENSBORO CHARLOTTE RICHMOND ATLANTA COLUMBUS, GA. NEW ORLEANS CHATTANOOGA TORONTO

KAMYR INC.

Introduces to North America

the tried and proven

KAMYR continuous cooking

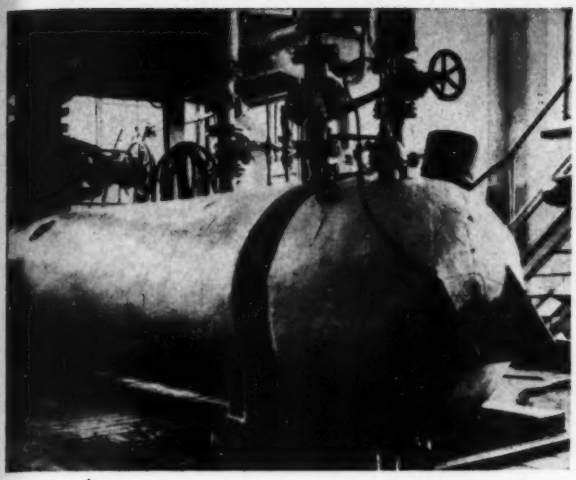


- UNIFORM COOK
- STRONG PULP
- HIGH YIELD

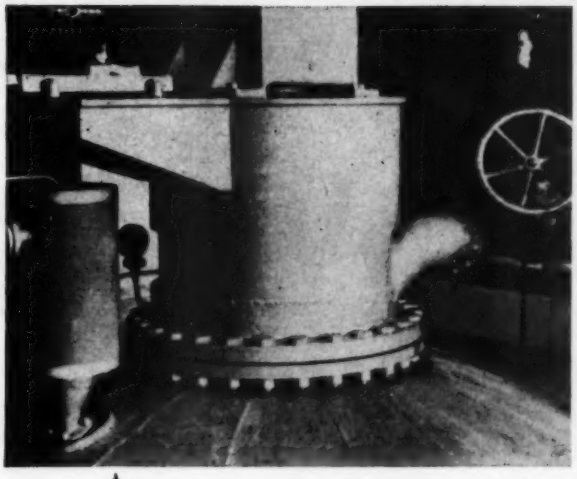
Plants operating and on order in

SWEDEN
FINLAND
FRANCE
ITALY
JAPAN
AUSTRALIA

For Information Contact KAMYR INC., Hudson Falls, N.Y.

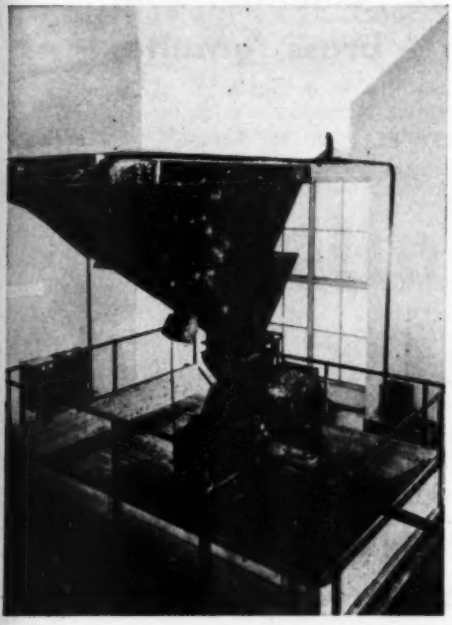


STEAMING VESSEL



TOP OF DIGESTER

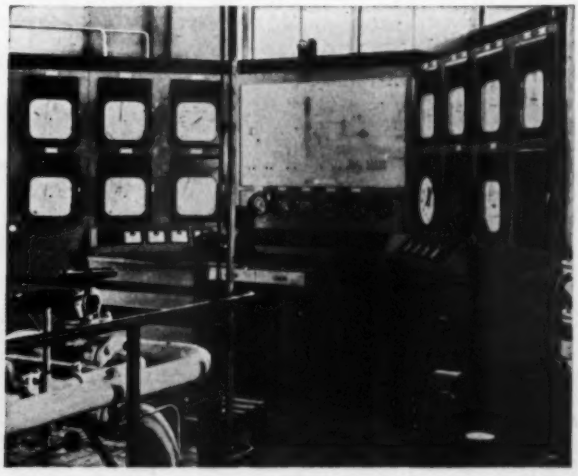
KAMYR CONTINUOUS COOKING OPERATING VIEWS



CHIP FEED

TOP OF BLOW TANK

INSTRUMENT PANEL



YOU Call the ROLL*

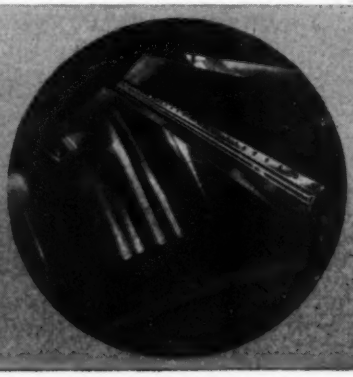
***Press Roll, Breast Roll, Wire Roll, Dryer, Calender Roll, Super Calender Roll — big or little — brass, granite, rubber, composition, steel, fibre.**

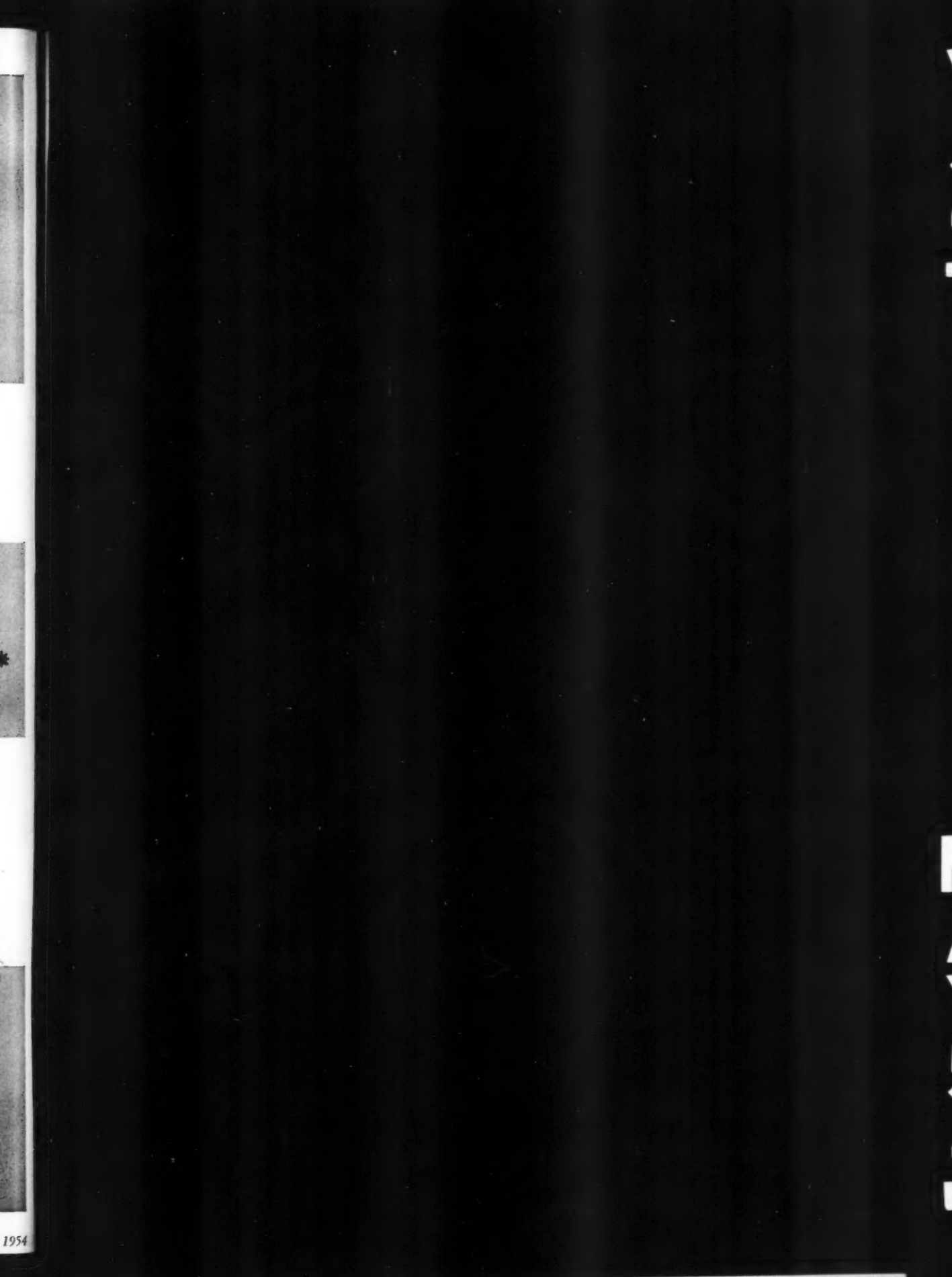
LET BIRD Call the DOCTOR**

****VICKERY Doctor, precision engineered and applied to each individual roll — Hi-Angle, Hi-Flex, Motor Oscillated, Hydraulic Oscillated, equipped with Air Lift when desired.**

For recommendations, layouts, estimates, get in touch with
BIRD MACHINE COMPANY, South Walpole, Massachusetts

VICKERY DOCTORS





The Paper Industry

May 1954

Are we operating at maximum productivity?

A. W. J. DYCK

HAS THE PULP AND PAPER industry fully achieved the anticipated productivity that was to justify the huge expenditures of the last decade on new equipment and production facilities? If not, or if only partly so, what should be done to obtain maximum productivity with the technical know-how and the highly efficient equipment we now have at our disposal?

These are questions that become increasingly important as the industry faces growing competition on the home and export markets. We can be sure that many mills will bring their operations to the highest obtainable level of productivity, because competition furnishes an ideal economic climate in which efficient operations flourish to become even more efficient. Competition provides the necessary stimulus that enables an efficient industry to operate with uncontested advantage on the competitive market.

What is productivity?

A gain in productivity implies an increasing rate of output per constant unit-imput. This is made possible through the discovery of better methods of production of improved products, the use of more efficient equipment, etc., that make it possible to put in fewer man-hours without sacrifice in product quality. In short, productivity is a measure of the over-all efficiency of an industrial establishment, whether this efficiency is accomplished through complete modernization of equipment or through adoption of improved operating methods with existing facilities.

Productivity is influenced by many factors. John W. Roberts, vice president of Albert Raymond & Associates, proposed the following definition of productivity, in terms of a mathematical expression, to a company manufacturing a wide variety of products:

$$PI = \frac{P \times MF \times LU \times EU \times TDR \times CAF}{\text{Man Hours}}$$

Where PI = productivity index
P = production
MF = mix factor
LU = labor utilization
EU = equipment utilization
TDR = technical development ratio
CAF = customer acceptance factor

For purposes of the discussion in this issue, we are mainly concerned with the qualitative evaluation of the "equipment utilization" and the "technological development" factors, which in themselves constitute a big enough problem to leave us with no illusions as to the limitations we must accept in our attempt to tackle this problem in one single magazine issue.

We do, however, propose to initiate the subject, stimulate a great deal of thought, indicate some of the more obvious steps that must be taken to achieve a high degree of productivity, and encourage an attitude that acknowledges technological change as an essential prerequisite to progress.

Economists have estimated that the average annual increase in productivity shown by the American industry is 3 to 5 per cent. Since capital expenditures greatly influence the rate of productivity, it was believed that productivity might have increased at a greater rate, following the $170,000,000,000 plant expansion that took place between 1946-1953.

Actually, the average annual increase in productivity over this period for the U. S. industry has remained at about 3 per cent.

We have no information to show what the pulp and paper industry's contribution is to the over-all national gain in productivity. The consensus among management and technical personnel is that this industry has achieved a remarkable rate of productivity as a result of equipment improvement and technological know-how. This applies particularly to new mills.

Productivity and specific measures of integration

In old mills, it is believed, productivity can be increased by about 20 per cent through better and specific measures of integration of equipment and processes. The integration of pulp and papermaking facilities alone serves as an example of what can be accomplished. The cost of pulp to an integrated mill may amount to $100-$110 per ton, as against the market price of $140 a non-integrated mill must pay. And this does not take into consideration the improved pulp quality that is retained by a pulp not subjected to drying operations.

However, a 20 per cent increase in productivity as a result of specific measures of integration or modernization cannot be guaranteed. In some cases, the cost and time consumed on all-out integration and modernization can be prohibitive. It is sometimes more economical to build an entirely new mill than to attempt a full integration of existing facilities. In most cases bottlenecks can be corrected or by-passed with relatively little expenditure.

Any proposed measures of integration and modernization must be sound and well-planned. While it is exceedingly unwise to install a piece of expensive equipment the performance of which is so out of line with the mill's operation as to stamp the mark of obsolescence on the mill's remaining equipment, it is equally unwise to hold on to a piece of antiquated equipment or to an inefficient operation that constitute a serious bottleneck to a much higher level of productivity. The correct decision here may well mean the difference between marginal and highly profitable operation.

Such reasoning, of course, sounds obvious and no mill management is so unprogressive as to be blind to the situation that (1) you do not achieve a gain in productivity by putting more into the mill that you can possibly hope to get out, and (2) that bottlenecks have to be eliminated and specific measures of integration taken to insure a high degree of productivity.

The system engineering approach

The difficulty is that it is not always easy to make a correct appraisal of the mill's production facilities or to determine what a mill's optimum productivity should be. And while we are all in agreement that bottlenecks should be eliminated, the less obvious bottlenecks are frequently not recognized, nor viewed in the proper perspective when evaluating their relative magnitude or their over-all effect on the mill's productivity.

It is here where system engineering makes its greatest contribution to the understanding and solution of this important problem, for it involves a comprehensive appraisal of operating facilities as an essential prerequisite to instituting specific measures of integration.

The training and qualification of a system engineer are of the highest caliber. He must have an exact understanding of operations, processes, equipment, and instrumentation. He must also be able to decide the extent of modernization any particular mill can economically afford.

Therefore, while the problem in its basic concept is simple and generally recognized, its precise evaluation and solution are not necessarily within the range of the technical grasp of the average pulp and paper mill.

Advances in continuous pulping foreseen

Elsewhere in this issue we have presented various examples of specific measures of integration of operating facilities that have brought about a streamlining of operations, eliminated costly handling of materials, or combined multiple units into a more efficient single operation — all resulting in achieving greater productivity.

There is no doubt that this trend will continue at an accelerated rate. The greatest foreseeable development may be a general conversion from batch digesters to continuous pulp digesters, and the subsequent integration of the pulping and pulp stock preparation operations. In this connection, it is suggested that screw-type feeding equipment for continuous delivery of chips into the digesters against a pressure of some 150 psi should undergo further improvement.

Apart from the more generally known advantages of continuous pulping such as (1) up to 40 per cent reduction in cooking liquor requirements, (2) more efficient utilization of heat and power, (3) more uniform cooking conditions in the digesters, (4) better control of operations, (5) high uniform pulp quality, and (6) lower labor costs, continuous digestion also lends itself to decentralized operation — at sources of optimum pulpwood supplies and paper markets.

The number of continuous digesters installed by Kamyr Inc., and already successfully operating in Sweden, Finland, Italy, France, Australia and Japan, is a definite preview of things to come in the pulping industry.

Industry's attitude toward technological progress

The consensus is that industry's constructive attitude toward technological progress has been well established. While there are instances where full advantage is not being taken of technological progress, few industries will fail to correct faulty operations once the advantage of a new piece of equipment or of a new process has been fully demonstrated.

The problem frequently seems to lie not so much in the failure to recognize the advantages of improved equipment as in the rate at which industry can afford to modernize its operations and the rate at which operators can be trained in the effective use of the new equipment. Management of a small mill or of a mill operating at a marginal profit—when faced with the decision of installing a $600,000 multiple evaporator—will come to the logical conclusion that it simply is in no position to venture into a liquor and by-products recovery operation. While this is an extreme case, the principle applies generally in the implementation of any expansion program.

The consensus further is that the same constructive attitude is prevalent among the mill operators. A factor, however, which tends to oppose operation at maximum productivity is the seniority rule, which now and then prevents management from giving full recognition to employees of exceptional merit and talent. The seniority rule can also turn into a double handicap, since it is usually a senior employee who is incumbered by too great a reliance on past experience and inaccurate information, sometimes at the expense of productivity.

Training and productivity

The important role training plays in achieving higher productivity is generally recognized. The larger and more progressive companies seem to have effective inter-company training programs to train their employees in the handling and operation of new equipment and processes. Not sufficient emphasis, however, is being put on the training of men who have the necessary technological background, knowledge, and practical experience to give them an intimate understanding of the over-all operation of the modern integrated pulp and paper mill.

It is this type of men that management must try to encourage and develop in sufficiently large numbers to enable the industry to proceed confidently with future planning and integration of equipment and processes. Only men who can make a comprehensive appraisal of the mill's entire operation, as well as of the available equipment, are ideally qualified to direct an expansion and integration program.

The importance of fundamental and basic technical training, as provided by the various colleges and universities, is self-evident. With the variety of new equipment constantly being developed, it is a waste of time and energy to train people to handle any single specific equipment or process. With a broad general knowledge, they can quickly adapt themselves to any specific situation.

In conclusion it is generally felt that if full advantage is taken of the TAPPI and APPSA technical papers and meetings, this in itself constitutes an unexcelled way of training that will prepare the industry's technical men for all emergencies.

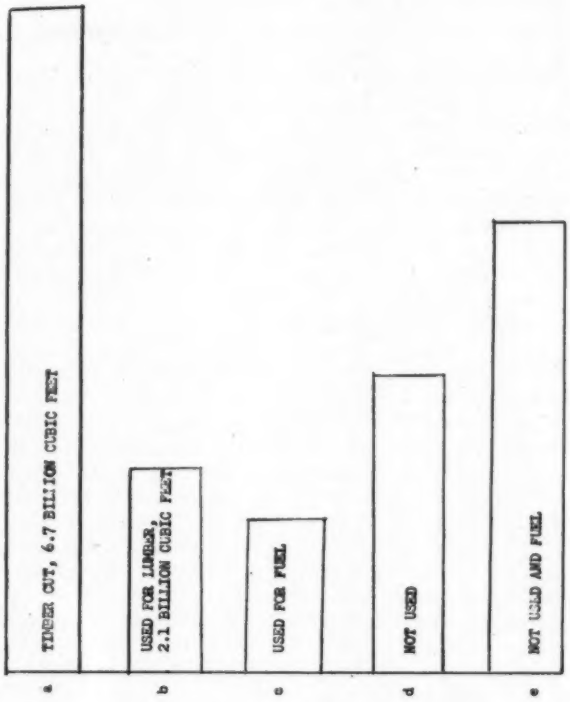


Fig. 1—Use and waste of trees cut for lumber, 1944

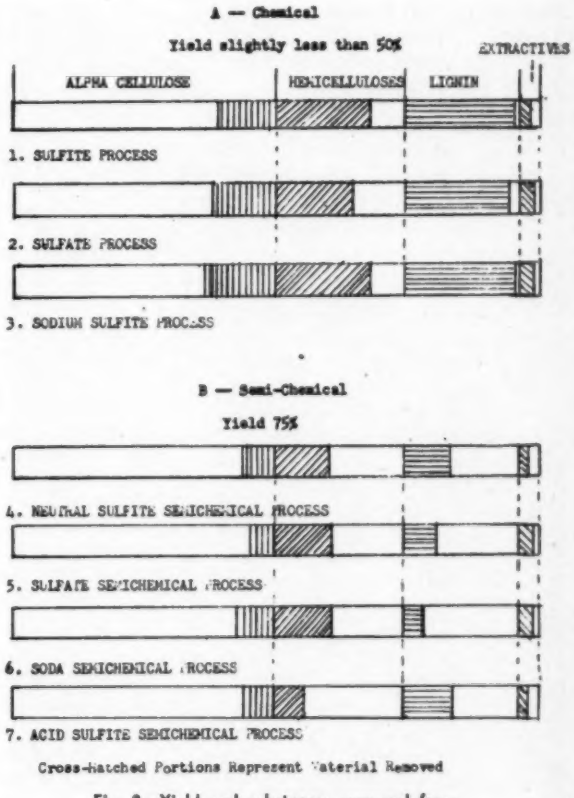


Fig. 2—Yield and substances removed from hardwoods in pulping

Increased productivity by integration

REAVIS C. SPROULL
Director, Herty Foundation
Savannah, Ga.

A DEFINITION OF TERMS is needed. As used herein "increased productivity" means the production of a greater quantity of paper and paper products from a unit of forest land. Integration means coordination of forestry, scientific knowledge, procurement and manufacturing so that more than one marketable product can be made from a unit of forest.

Many interests have focused attention on the necessity for increasing the productivity of our forests. The 1953 lumber production was 39.2 billion board ft., and the production of paper was about 26,566,000 tons, in each case the largest in history. With a steadily increasing population, there will be a steady demand for lumber and paper as well as many other items manufactured from trees.

More effective utilization of wood

Increased productivity must begin by finding means to use a greater quantity of the trees which are cut especially for lumber. Several measures have contributed some and will contribute much more to effective utilization:

(1) Development of means for debarking sawmill logs and irregularly shaped sticks. Hydraulic debarking can be adapted to large trees in large operations, whereas the "Impco" and Soderhamn barkers are better suited to smaller and irregular logs.

(2) Selection and design of equipment for obtaining chips of uniformly small size and dimensions from slabs, edgings and

trimmings to increase the per volume digester yield. Some such equipment is already in use in a few locations.

(3) Development of specifications and test methods which will be mutually acceptable to the lumber companies and the pulp mills. This implies equal integrity for both.

(4) Selection or development of means for screening, cleaning, handling and removal of residual traces of bark. Cleaning and debarking must be done early in the process so as to maintain a low cost per unit of product.

(5) Discovery of methods to utilize the bark which represents from 10-15 per cent of the volume of unbarked wood. As the size or quality of the pulpwood decreases, the volume of bark increases.

(6) Methods for obtaining high pulp yields.

Based on an estimate of 69 cu. ft. of solid wood logging waste per 1000 board ft. of lumber (*1*) and allowing 30 lb. per cu. ft., the logging waste from lumber alone was 2.4 billion cu. ft. or 31,000,000 tons in 1953. For 1944 the Forest Service estimated 49,000,000 tons of logging waste from lumber and other woods operations. The 1953 removal was greater than in 1944, but allowing for better utilization, an estimated annual total of 46,000,000 tons is made. If it may be assumed that one-half, or 23,000,000 tons, of this could be collected and used instead of pulpwood it could replace 12,000,000 cords of prime trees, which then would be left for future growth. This represents more than 40 per cent of the total annual consumption of pulpwood. Herein is the greatest opportunity for prompt increase in production. Fig. 1 shows graphically the Forest Service data for 1944. The relationship of individual portions has not changed markedly since then.

After the wood enters the pulp mill, as chips it may be processed by chemical or semichemical and mechanical means. As pulpwood the mechanical process may be applied. Since adequate strength is not developed by the mechanical process, chemical or semichemical means must be used. Fig. 2 compares the common pulps with respect to yield (*2*) and substances removed. In general, at the unbleached pulp level the kraft or sulfite processes will yield 50 per cent, whereas the semichemical will yield 75 per cent. Thus a unit of forest which will yield 100 tons of unbleached kraft pulp would produce 150 tons of unbleacheed semichemical pulp. The semichemical has the added advantage of adaptability to a greater variety of trees, including the heretofore undesirable hardwoods.

Table I shows production and consumption for 1953 compared with the estimates if the sawmill waste is used as chemical or as semichemical pulp. Production can be increased by more than 30 per cent by use of sawmill waste in chemical pulp and by more than 40 per cent if the semichemical process is applied. This is only one form of wood waste. Many others can also be found to increase the potential to at least 50 per cent of the pulp needs.

In many areas illustrated by the State of Georgia, culled hardwoods have increased disproportionately with respect to the total volume of trees (*3*). To extract greatest values from a forest unit, uses for these must be found. In 1952 the southern pulp industry used 1,782,100 cords of hardwoods, about 12 per cent of its needs. This represents an important start toward integrating with the forest. As 30-40 per cent of the forest land is in hardwoods, the trend to use hardwoods should continue to grow until an integrated balance is struck. Production of pulp might be increased by 20-25 per cent per average forest unit by use of the hardwoods.

These generalizations must allow for distribution of the sawmills with respect to the pulp mills and wood supply. A balance must be maintained between the kind of products and raw material used. No sudden changes, but planned development, is needed.

In summary, by integration of the forest supply of trees with uses in lumber and pulp alone, the production per forest unit may be increased by 70-75 per cent without cutting greater quantity of trees and at the same time the quality of the forest be improved.

Integration must accelerate as the population increases and the demand for fiber products increases. It is estimated that new population alone will need about a million tons of new paper products each year at the present level of per capita consumption. Scarcity of raw materials and a demand for the products will provide an economic atmosphere for higher production per forest unit.

More efficient use of waste papers, culled woods and the like can be made in products which do not require selectivity of quality wood. As man's appetite for easier construction materials and rapid methods of manufacture continues to be satisfied there will be a greater and greater demand for fibrous wall board, hard board, insulation, roofing felt, and fiber combinations with binders. These should be made from trees which are less uniform and more difficult to process chemically.

Foremost in increasing productivity of our forest must be the will of people in all branches of our forest industries to utilize each tree at its highest possible economic value. This implies cooperation and a spirit of good will among the tree grower, the lumberman, the forester, the equipment designer, the pulpwood buyer, the pulp mill operator, and the paper manufacturer.

TABLE I

Comparison of Production and Consumption 1953 With Estimates, (1000's) (1)

1. Total pulp production, tons	17,525
2. Total pulp consumed, tons	18,682
3. Pulpwood consumed, cords	28,000
4. Kraft pulp produced, tons	9,435
5. Sulfite pulp produced, tons	2,321
6. Total sulfite and kraft produced, tons	11,756
As Chemical Pulp, Estimates	
7. Potential pulpwood from sawmill waste, estimated, cords	12,000
8. Kraft pulp from sawmill waste calc. @ 1.8 cord/ton	6,600
9. Potential total pulp production using sawmill waste and kraft or sulfite processes, tons	24,125
As Semichemical Pulp, Estimates	
10. Semichemical pulp from sawmill waste calc. 1.14 cord/ton	10,520
11. Potential total pulp production using sawmill waste and semichemical, tons	28,045
12. Theoretical potential pulp if all kraft could be replaced by semichemical and sawmill waste used as semichemical, tons	32,760

(*1*) Figures for 1953 taken from U.S. Department of Commerce, "Pulp, Paper and Board," *Industry Report X*, No. 1, March, 1954.

References

(*1*) U. S. Forest Service, Report 4, "From a Reappraisal of the Forest Situation," page 10, 1947.
(*2*) Chidester, G. H. "Semichemical Pulping." *Forest Products Research Society Preprint*, 1949.
(*3*) Demmon, E. L. *The Paper Industry*, May, 1953.

Belt conveying system with unique loading chute for pulpwood at Westvaco's Covington mill

Woodyard operations

Standardization of equipment, streamlining of operations, straight-line movement of materials are factors that are of utmost importance in increasing productivity.

THE HIGH COST OF wood-handling equipment points to the necessity of standardizing this type of equipment.

As disclosed in a study on woodyard operations conducted by the Technical Section of the Canadian Pulp and Paper Association, there is considerable variation in the number and type of equipment used by various pulp and paper mills in their wood-handling operations. Thus the conveying and stacking equipment has been shown to vary from three conveyors used for the daily handling of 750 cords of pulpwood to 21 conveyors used in the daily handling of 250 cords. The number of stackers used in other mills varied between one and nine. Obviously, discrepancies of such magnitude, no matter what the differences in individual requirements as dictated by mill design and operation may be, call for a re-examination by the individual companies of their woodyard operations.

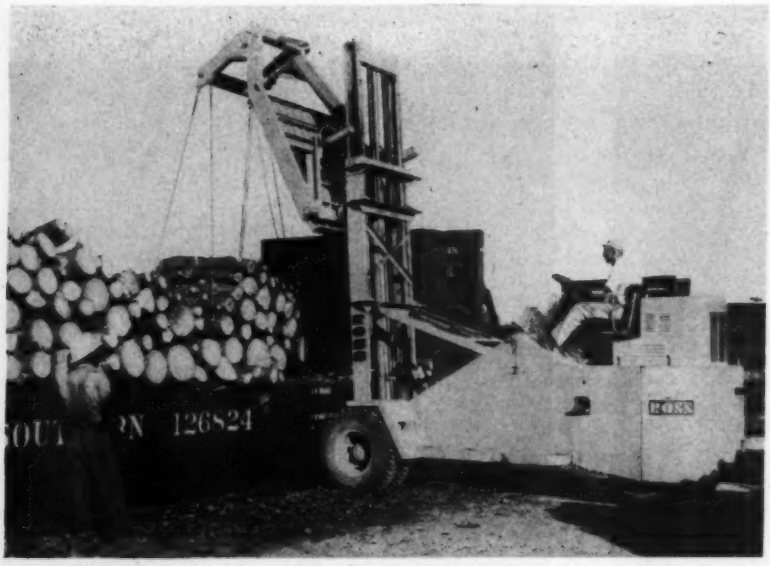
The recommendations made to achieve greater productivity in woodyard operations are:

1. Standardization of methods and types of equipment. According to the committee's report, almost all stackers are made according to customer-specifications, and most mills use at least three different types of conveyor systems.

2. A better correlation is required between handling-capacity of equipment and actual requirements. Some mills are using equipment that is far beyond anything the company will ever need, while other mills undoubtedly have inadequate pulpwood handling capacity.

3. A better integration of equipment is required. Chain speeds of conveyors are sometimes in excess of company requirements. The relative capacities of conveyors, stackers, chippers, and barkers should not differ too widely.

4. The woodyard layout should be such as to permit streamlined operations. Mill expansions are frequently



Clark-Ross 18,000 lb. capacity machine equipped with pulploading device

allowed to proceed in the direction and at the expense of the woodyard, with the result that operations in the woodyard become crowded and develop into a maze of conveyors crisscrossing one another in all directions. To achieve maximum efficiency, the woodyard should always be well separated from the mill.

5. The woodyard should be laid out in such a manner as to permit a straight-line movement of all materials, so as to avoid doubling back and duplication of conveyors.

The modern trend, wherever topography permits this, is toward the integration of flumes into the pulpwood conveying system. The main difficulty with flumes, however, is that there is no satisfactory way of sand and grit removal from the water, which in most cases has to be recirculated through the flumes for economical reasons.

In the April issue of THE PAPER INDUSTRY was described an efficient rubber belt conveying system for pulpwood, with unique chute loading facilities and rolling impact-free transfer of the bolts to the belt, which has been put into operation at the Covington, Va. mill of West Virginia Pulp & Paper Co. The rubber belt conveying system has many advantages over the flume system and is said to operate at extremely low maintenance cost compared to chain conveyors. In general, the trend in woodyard operation seems to be toward the elimination, as far as possible, of chain conveyors, due to their extremely high maintenance cost.

What is urgently needed is the development of an economical structural design of overhead belt conveyors. There is also need for a measuring device that will quickly and accurately measure by volume the pulpwood loads brought in on trucks.

For sorting and distribution of pulpwood, much interest is shown in the recently developed rotary feeders which are being installed to replace conveyors wherever possible.

A novel development in woodyard operations is the system of underwater storage of barked logs, which is about to go into operation at Bowaters Southern Paper Corp. This system—developed to check the rapid deterioration of stored pulpwood—includes a pond capable of holding 30,000 cords pulpwood under water. In the center of the pond is a 40-ft. diameter turntable from which logs are scraped onto a revolving stacking conveyor, which distributes the logs in a semi-circular pile in the pond.

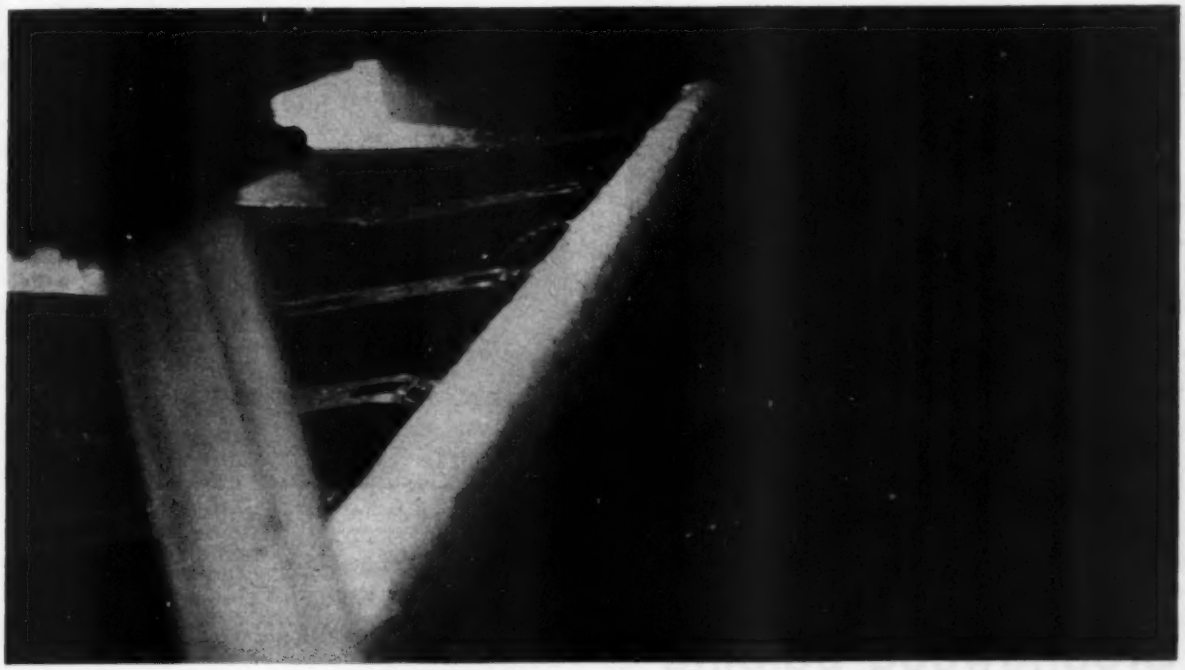
The removal of the logs from the pond is accomplished by means of two Gantry cranes, which place the logs onto chutes at the center of the turntable from whence they are scraped to the lower strand of a figure "8" cable conveyor for transportation to the wood room.

Barking and chipping operations

BARKING AND WOOD CLEANING, if not carefully done, can result in wood losses amounting to 15 per cent of the pulpwood. To achieve maximum productivity, it is therefore important to examine these operations with the view to determining whether wood losses are being kept to a minimum. It has been authoritatively suggested that, to get the most fiber out of a piece of wood, it may be advisable to bark to a necessary minimum, even if it means leaving some of the dirt and bark for removal in subsequent pulp refining operations.

The conventional method of bark removal for pulpmill requirements is by means of a drum barker. And here the present trend is toward dry barking and the use of wider and longer barking drums — especially in hardwood barking.

On the West Coast, where most sawmill and pulp mill operations are completely integrated, it has been found economical to remove the bark by hydraulic means, i.e. by the use of powerful jets of water which effectively peel off the bark at the cambium layer. With this method, wood losses and labor costs are kept to a minimum, and the logs come out completely clean. Makers of the hydraulic type barker are



View of the nozzle action of a Sumner Bellingham type hydraulic barker in operation at Weyerhaeuser Timber Co.'s White River mill

▶ Barking and chipping should be carried to a necessary minimum to avoid loss of valuable fiber.

▶ The uniformity of chip size is of utmost importance in achieving a high degree of productivity in subsequent pulp making.

▶ For maximum productivity, barking and chipping should be integrated with sawmill operations, both on grounds of forest economy and to achieve a better segregation of the wood into (a) a fraction best suited for lumber production and (b) a fraction best suited for pulping.

(1) Hansel Engineering Co. Inc. and (2) Sumner Iron Works, both of Seattle, Wash.

Purity of water is a major consideration in the operation of hydraulic barkers, because water carrying suspensions of dirt, clay, or other mineral deposits can cause rapid erosion of the high-powered pumps and the jet nozzles to a point where maintenance costs become prohibitively high. The cost of a hydraulic barker, including installation and auxiliary equipment, is in the neighborhood of $130,000, and its use is considered to be economical for mills with a 300,000 fbm annual cut.

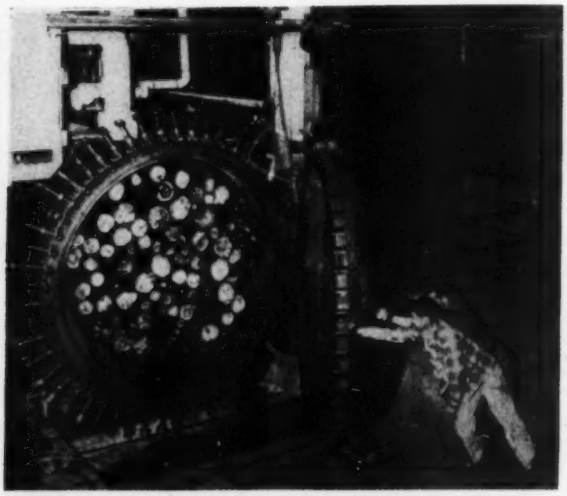
There is a definite trend to move the barking and chipping operations into the woods, where they can be integrated with sawmill operations with the view to utilizing sawmill and logging wastes. For this purpose, a number of mechanical barkers have been developed, such as the Andersson, Nicholson, Mira, Skoglund, and, more recently, the Impco barker. The Impco barker, described in the April issue of THE PAPER INDUSTRY, differs from the others in that its tool pressure is maintained by powerful springs instead of air pressure or centrifugal counterweights.

It is well recognized that the integration of barking, chipping, and sawmill operations is in the interest of our national forest economy for the obvious reason that it provides a means of utilizing sawmill and logging wastes.

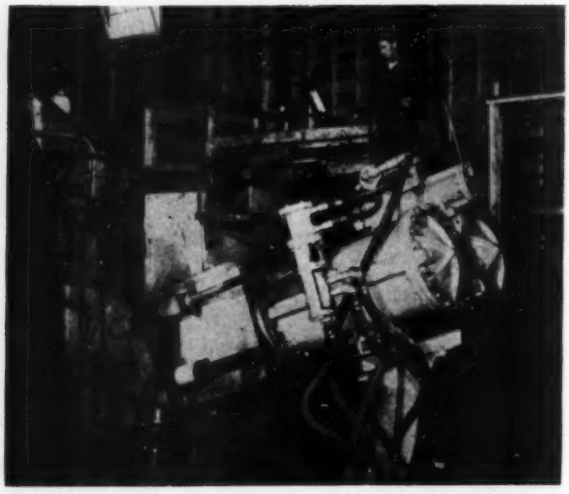
The effect of such integration on increased productivity, although not as widely publicized, is equally obvious. For it automatically re-routes most of the heartwood, which at best is not too desirable for pulping purposes, to the sawmills, and the easily digested slabs, which furnish a pulp of superior quality, to the pulp mills.

In chipping operations, the production of smaller and more uniform chips — made possible by the use of multi-knife chippers — results in increased productivity since it permits an increase per single digester charge and facilititates better liquor penetration of the chips and more uniform cooking.

As disclosed in an article in this issue on "Increasing Quality and Production in High-Yield Kraft and Semichemical Pulps," by W. J. Nolan, production can be increased by another 20 per cent and cooking time reduced from 2.5 to 1.5 hours if chips are shredded prior to pulping. While formerly it was thought necessary to soften the chips with steam prior to shredding to prevent fiber damage, this is no longer necessary with the latest techniques which employ high-speed attrition mills with very wide plate clearances. An example of a high-speed attrition mill is the Roto-Pulper made by Jackson & Church Co.



One of the two 10-cord pressure vessels used in pilot plant impregnation of barked logs prior to grinding at Great Northern's E. Millinocket mill



Magazine grinder used at the Great Northern mill for the production of chemi-groundwood pulp

Groundwood pulping

The chemigroundwood process, in which barked logs are impregnated with a chemical prior to grinding, appreciably reduces power consumption in newsprint making.

IN AN ARTICLE ENTITLED "Processing and Manufacturing Trends in Southern Pulp and Paper" in the May, 1953, issue of THE PAPER INDUSTRY, we expressed the opinion that, since cheap power is a prerequisite to economical newsprint production, a greatly expanded newsprint industry could not be anticipated in the near future. At the same time, it was admitted that the whole picture might radically change with the development and perfection of new processes for the manufacture of groundwood pulp that would make this operation less dependent on the availability of cheap power. Apparently, this development has now materialized.

Great Northern Paper Co., following its expansion program at the East Millinocket mill, will produce chemi-groundwood pulp from hardwoods. The method involves a chemical treatment of barked logs before grinding. The installation design, based on a year's operating experience with a 50-ton commercial pilot plant, provides for two vertical 62-ft. high and 10½-ft. diameter steel pressure cookers in which 4-ft. hardwood logs will be impregnated with a chemical.

The treated logs will be discharged into pits through hydraulically-operated bottom doors. From the pits the treated logs will then be transferred mechanically to conveyors that will feed the new grinder room.

The chemical pre-treatment of logs will greatly reduce the power consumption of the grinders, at the same time making possible the production of high-quality groundwood pulp from hardwoods.

The modern grinders are equipped with governors and hydraulic control equipment. Each grinder is driven by a 4500 to 5000 hp synchronous motor. The pulpwood is charged into pockets of the grinder and pressed hydraulically against the revolving grindstone.

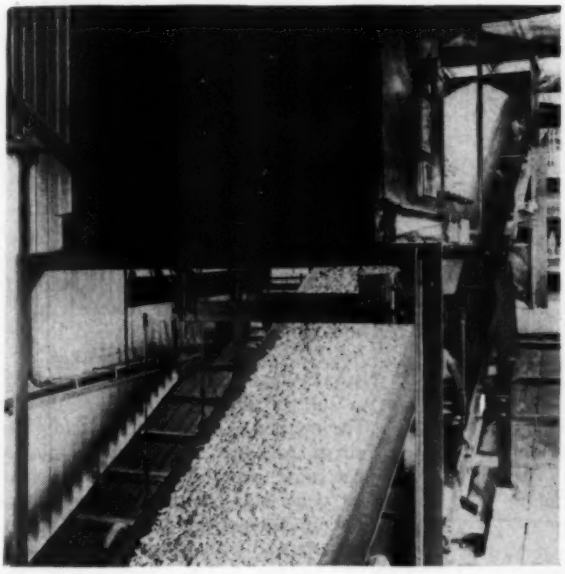
Sulfite pulping

PRODUCTION IN CHEMICAL pulping, whether it be sulfate, sulfite, or semichemical, is affected by such considerations as (a) placing the emphasis on obtaining maximum pulp yield per individual digester charge or (b) increasing the number of digester blows—or the digester cycle — per daily operation.

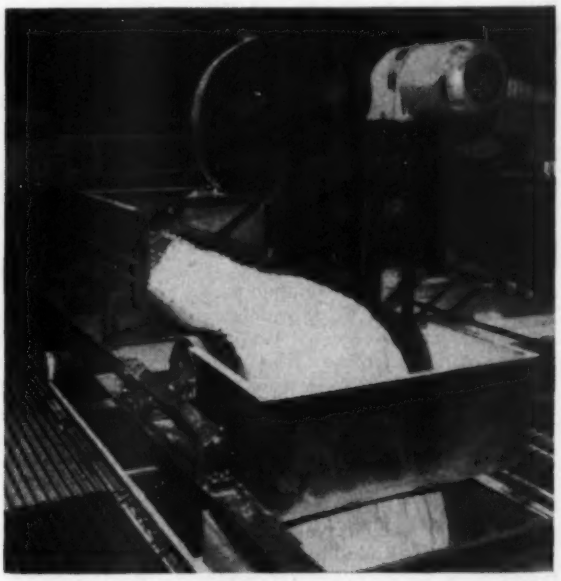
For maximum productivity of pulp of the desired quality, there exists an optimum balance between these two factors, although some mills, having the advantage of easy access to an unlimited pulpwood supply, may find it profitable to operate at a high digester cycle and a correspondingly lower yield level per individual charge. The majority of pulp mills, however, operate at a high yield level per digester charge.

Increasing yields per digester charge

To get a high yield per individual charge, the obvious procedure is to pack an optimum quantity of pulpwood into the digester and extract the maximum quantity of fiber from the digester. This is facilitated by:



The Merrick Weightometer automatically weighs the chips on the 42-in. moving belt as they are conveyed from the silos to the digester room at St. Regis' Jacksonville, Fla. mill



Chips are discharged to digester from Link-Belt rail-mounted reversible power-propelled shuttle belt conveyor at the St. Regis Jacksonville mill

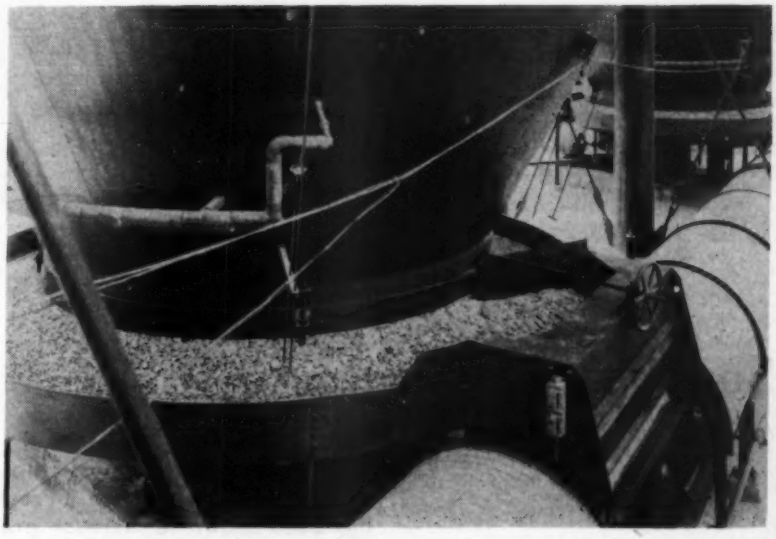
1. Using small chips of uniform size;

2. Charging the digester with high density wood chips;

3. Using a chip packer, although caution must be observed to leave sufficient room for an adequate liquor charge—yield differences as high as 40 per cent have been ascribed to faulty digester charging;

4. Pulping conditions should be as uniform as possible throughout the digester charge; non-uniform conditions will result in the presence of overcooked pulps in some parts of the digester and of inadequately cooked chips in low temperature areas, and

5. The use of an optimum concentration of the cooking liquor.



One of the three 17-ft. diameter Link-Belt rotary plate chip feeders at the St. Regis Jacksonville mill that delivers chips from silos to belt conveyor

Increasing digester cycle rate

To operate at the high digester cycle rate it is essential that particular attention be paid to

1. Shortening the charging period, consistent with orderly chip arrangements; in this connection, the acid pump should be of adequate size and be operated at maximum capacity.

2. Shortening the penetration period; this can be achieved by using chips of small and uniform size, uniform moisture content, free circulation or hot acid, high sulfur dioxide content, and high operating pressure.

3. Shortening the cooking period by operating at the optimum temperature level, which is conducive to a most rapid removal of lignin and a minimum removal of cellulose.

4. Shortening the discharging period, which is mainly determined by the method of discharge, i.e. blowing or dumping.

Care should be taken to reduce fiber losses to a minimum during pulp washing operations. To recover some of this elusive fiber, the white

▶ The application of VA-Purge to conventional sulfite pulping greatly increases productivity.

▶ The ever-increasing problem of stream pollution has focused attention on soluble-base sulfite pulping, and here the ammonia-base method presents many exclusive advantages.

water from the washers and thickeners may be used to supply part of the wash water in the blow pit, which subsequently is recirculated through the filters. Bleach shrinkage may be considerable, amounting to as much as 5-10 per cent.

Soluble base sulfite pulping

A bottleneck of increasing importance in acid sulfite pulping is the spent liquor disposal problem. As a solution to the stream pollution problem, the question is being widely debated whether it would not be advisable to change from the calcium base sulfite method to a soluble base, such as magnesium base, sodium base, or ammonium base method of sulfite pulping.

Adoption of the magnesium base method, which permits complete liquor recovery, would involve tremendous capital expenditure due to the high cost of the liquor recovery equipment. Not too many sulfite pulp mills are prepared to make this expenditure.

The change to a soda base sulfite pulping method has not been considered too favorably until recently, in view of the non-existence of an efficient economical way of recovering the base from the spent liquor. A Sulfox process has now been developed and improved which is credited with recovering the chemicals of all soda base sulfite processes, both acid and neutral. With the calcium base sulfite process, a sulfite mill may use 270 lb. of sulfur and 300 lb. of limestone per ton of pulp. If such a mill were to convert to the soda base method and adopt the Sulfox recovery process, its consumption of chemicals would drop to 70 lb. of sulfur and 40 lb. of soda ash per ton of pulp, it is claimed.

Mills in which output capacities do not justify the installation of a full recovery unit are more inclined to adapt the ammonia base sulfite method, which permits only partial recovery of chemicals. The advantages of this method, as listed in an article by G. H. McGregor published elsewhere in this issue, are:

1. Reduction of cooking time by about 20 to 25 per cent.
2. Better penetration of chips by the cooking liquor, resulting in better yields and more uniform pulp quality.
3. Fewer screen rejects.
4. Reduction of sulfur consumption by 40 lb. per ton of pulp.
5. Reduction of materials handling and maintenance costs.
6. Complete absence of strainer scale, blow nozzle scale, indirect heating scale, and blow pit bottom scale.
7. Ease of washing and screening of pulp due to less foam formation.
8. Lower cost of evaporation of spent liquor due to absence of scale.
9. Wider possible utilization of wood species, including hardwoods.
10. Simplified equipment requirements.
11. No significant difference in the cost of materials required when compared with the calcium base sulfite method for the production of unbleached pulp.

The VA-Purge process, developed at the Pulp and Paper Research Institute of Canada and described in the July, 1953, issue of THE PAPER INDUSTRY, has been successfully applied to sulfite, sulfate, and soda pulping. The method is based on replacing the air in the chips with steam or soluble gas prior to pulping to achieve a better penetration of the cooking liquor. The advantages ascribed to this method are (1) improved pulp quality; (2) increased pulp yields; (3) reduction in cooking time; (4) lower consumption of steam and chemicals; (5) ability to cook mixtures of wood species with little regard to variations in moisture content.

A digester suitable for VA-Purge pulping should be equipped with strainers and should have provision for very rapid steaming, purging, and introduction and withdrawal of liquor.

Semichemical pulping

▶ Uniform penetration of chips is one of the main considerations in semichemical pulping. Preshredding of chips prior to pulping has been shown to increase productivity markedly.

UNLIKE A FULL CHEMICAL pulping process, semichemical pulping includes a mechanical defibering operation following the discharge of softened chips from the digester.

The maximum yield of semichemical pulping—which under ideal conditions should approach that of groundwood pulping—is limited by the fact that the chips have to be cooked to a sufficiently high degree (to a fiberizing or just short of the fiberizing point) to permit easy discharge from the digester.

Uniform penetration of chips

It follows therefore that the uniform penetration of chips by the cooking liquor is one of the most important considerations in semichemical pulping. In this connection, as reported by J. N. McGovern, chemical engineer of the Forest Products Laboratory, "Application of principles of forced penetration* by means of procedures and equipment now available can result in a shortened time cycle as well as improving pulp uniformity. It may also permit shortened cooking time, increased yield, and increased fiberizer production."

Efficiency of the mechanical defiberizing operation can be increased and power requirements reduced by prefiberizing the cooked chips in a press and passing these prefiberized chips in a one-pass operation through the fiberizer. The use of hot water with the chips, operating at high consistency, making pulp with the highest freeness compatible with desired properties will also reduce fiberizing power requirements.

*An example of this is the VA-Purge process referred to under Sulfite Pulping.

Preshredding of chips

W. J. Nolan, University of Florida, has demonstrated that productivity in semichemical pulping can be increased by preshredding the chips in a high-speed attrition mill (such as a rotapulper) before cooking, pressing the liquor from the softened chips leaving the blow pit, and hot-refining at high consistency (as high as 50 per cent). By proper preshredding it may be possible to soften the chips to permit semichemical pulp yields as high as 85-90 per cent and the day may not be too far in the future when semichemical pulps may compete on an economic basis with groundwood for the production of newsprint.

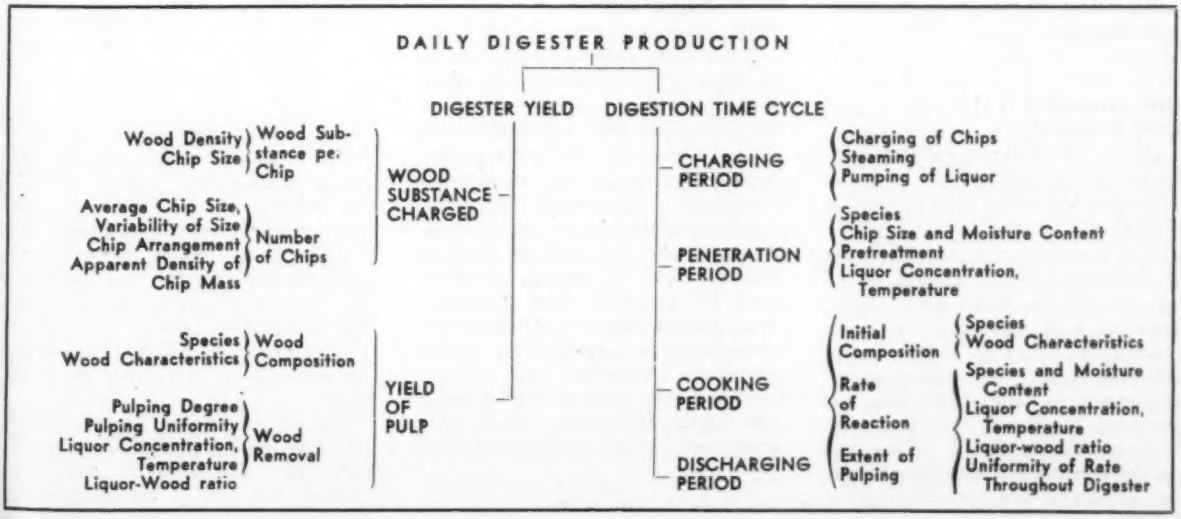
Continuous pulping

The most spectacular developments in semichemical pulping are the continuous Chemipulpers, Pandia units, installed at the American Boxboard Co. mill, Filer City, Mich., and the National Container Corp. mill at Tomahawk, Wis. Each Chemipulper unit consists of six tubes each 36 in. in diameter and 21 ft. long. Chips are fed continuously into the top tube by means of a specially constructed conical screw operating against a pressure of 170 psi. The chips are sprayed at the throat of the screw with cooking liquor pumped by a 300-lb. Allis-Chalmers pump equipped with a Foxboro orifice-type metering device. The softened chips, in the case of the American Boxboard mill, pass through

(*Continued on page* 155)

One of the two Pandia Chemipulpers that are in operation at the Filer City, Mich. plant of American Box Board Co.; the two units currently produce 290 tons of semichemical pulp daily (courtesy Dale Rooks, Grand Rapids, Mich.)

Semichemical Process Variables Affecting Pulp Production



Increasing quality and production in high yield kraft and semichemical pulps

W. J. NOLAN
Pulp and Paper Laboratory
Chemical Engineering Department
University of Florida

▶ The question, "How successful is successful?" causes one of the biggest headaches for the research engineer in his contact with management.

▶ Operation changes such as preshredding the chips, pressing the cooked chips prior to hot refining, and refining the chips at 40 per cent consistency may make present successful operations even more successful.

IN DEVELOPING THE THEME of successful operation of modern equipment and processes, the first question that comes up is, *How successful is successful?*

From the standpoint of the stockholder, a mill might be considered successful as long as a reasonable profit is returned at the end of each year. But if the engineer knows that by slight changes in his flow sheet or by the addition of new equipment, he can increase production, cut operating cost or increase quality, can he consider the existing process to be successful?

This question of "how successful is successful" causes one of the biggest headaches for the research engineer in his contacts with management. When the plant is losing money and operations are downright unsuccessful, management looks, and looks hard, at the research man for immediate changes which will change the balance sheet from red to black. But, when operations are "successful" the research man has a tough job of selling his ideas unless he comes up with that rare process which permits the amortization of all equipment in one or two years, plus a substantial profit along the way.

How successful is the kraft process?

Let us use the kraft pulping process as an example of how changing techniques will alter one's judgement as to whether a process is "successful." A few years ago, in the production of unbleached kraft, a yield of 48 per cent was considered good. Now, however, high yield kraft is being produced in yields up to 70 per cent and even higher. In addition to improvements in yield, production rate has been increased because of decreased cooking cycles. The only penalties for these improvements were the installation and operating costs of refining equipment and the foaming and washing difficulties resulting from hot refining. If the high yield kraft mill were forced to return to old techniques, management would find the old operations to be quite unsuccessful.

We would like to submit to the industry some operation changes which may make the production of high yield kraft even more successful. These changes involve the preshredding of chips before pulping, pressing the cooked chips before hot refining, and refining the chips at 40 per cent consistency. These changes involve minor investment costs for equipment and should result in increased production, improved quality, and decreased power costs.

Increased production through shredding of chips

The shredding of chips before pulping has been under investigation at this laboratory for the past four years. It has been found, in the production of fully cooked kraft pulps, that yield of screened pulp can be increased from 43.4 to 50 per cent if chips are shredded before pulping.* This means that production can be increased by about 20 per cent with no increase in wood cost. In addition, cooking time was decreased from 2.5 hours for full-sized chips to 1.5 hours for shredded chips, resulting in a further increase in production.

It was felt, early in the research, that the shredding action would cause some fiber damage to the chips unless the chips were softened by steam before shredding. However, the latest techniques, involving the use of high-speed attrition mills with very wide plate clearances, indicate that the green chips can be fed directly to the shredding equipment and suffer negligible fiber damage. A very good indication of the efficiency of the shredding operation can be obtained by a screen analysis of the product. The mesh size is an indication of the cross section at right angles to the grain, since practically all of the shredded material is the same length, in the grain direction, as the original chips. A typical screen analysis for shredded pine is as follows:

Screen Meshes per in.	Percent of wood retained
+2	8.1
−2+3	21.5
−3+4	28.0
−4+8	32.0
−8+10	5.2
−10+16	3.3
−16	1.8

Fiber damage appeared to be confined to the material passing through the 10 mesh screen. About half of the splinters passing 10 mesh and retained on 16 mesh were broken up into pieces considerably shorter in the grain direction than the original chips. The fraction passing through 16 mesh was completely broken into fines. The total material suffering fiber damage was only 5.1 per cent of the total wood.

The power costs for this shredding operation are extremely low. Several tests on hammer-mill shredding showed that only 3 hp hours were

*Nolan, W. J., and Brown, W. F., *Tappi*, Vol. 35, No. 9, (Sept. 1952)

consumed per ton of wood. Exact figures are not yet available on shredding in this attrition mill, but indications point to a power cost of the same magnitude. Very low power consumption should be expected when it is realized that practically all of the splitting occurs in the grain direction of the wood.

It is to be expected that the use of preshredded chips should be particularly advantageous in the production of high yield kraft pulps. The chips are delignified only to the extent necessary for the production of strong pulp in the refiners. It would seem logical that the smaller the cross section of chips subjected to chemical action, the more uniform the lignin removal and the shorter the time necessary to reach the required degree of lignin removal. Power costs for refining should be lower than when full-size chips are used and quality of fiber should be improved. Refiner clearances can be set with a greater degree of accuracy since the refiner feed is much smaller than when shredded chips are used.

The degree of reduction in cooking time caused by the use of shredded chips will depend mainly on the speed with which the digesters can be brought to full steam pressure. The greatly expanded surface area exposed for reaction by shredding the chips will permit more rapid steaming than is used at present.

Pulp pressing eliminates foaming troubles

The washing of high yield kraft pulps can be considerably improved and the foaming troubles caused by hot refining can be eliminated if the black liquor is pressed from the pulp before refining. It should be possible to pass the softened chips from the blow pit through a screw press so that the consistency of the pressed chips will be 40 per cent or higher. This pressing may be used as the first stage of washing, since 83-85 per cent of the black liquor is removed without dilution.

Since the chips entering the refiner from the press are at a consistency of 40 per cent or higher, it is impossible to cause foaming by the intimate mixing of air and pulp in the refiner. The quality of pulp produced by defibering at high consistency is very good. It has been common practice in this laboratory for the past two years to carry out fibrillation at consistencies as high as 50 per cent, and the strength characteristics of the resultant pulps are as good as those produced at low consistency. A commercial size refiner, operating at 1800 rpm, is used in this operation. Power costs for defibering are, of course, considerably lower when high consistency is used. On a basis of 100 lb. dry pulp, only 150 lb. of water pass through the machine at 40 per cent consistency, as compared to 900 lb. of water at 10 per cent consistency. The work done on the fiber per kilowatt of power input is, therefore, much higher when high consistencies are used.

Application to semichemical pulping

The incorporation of these principles of preshredding of chips before cooking, pressing the black liquor from the chips leaving the blow pit, and hot refining at high consistency, into the flow sheet of high yield kraft pulping should materially increase the efficiency of the process. The pulp produced per ton of wood and tons of wood processed per unit of digester capacity should increase. Quality of fiber should be improved because of more uniform pulping and by refining through a narrower range of particle size. Power costs of defibering will be reduced and washing efficiency will be improved by the elimination of foam. In other words, the successful operation of the process will become more successful.

These same principles apply equally well to the whole field of semichemical pulping. High yield kraft pulping is, in reality, semichemical pulping with hardwood being replaced by conifers. Of course, if neutral sulfite liquor is used as the pulping medium, the drastic foaming problem inherent to kraft liquor is not present. However, the advantages to be derived from defibering at high consistency will warrant the placing of the first washing stage, in the form of a screw press, ahead of the refiners.

The savings that can be realized in semichemical pulping by the use of preshredded chips and high density refining may make it economically practical to extend the use of semichemical pulps into the newsprint field. By proper preshredding of the chips, with consequent expansion of surface area, it may be possible to uniformly soften the chips and still realize a yield of 85-90 per cent. The softened chips can be reduced to fiber by refining at high density. This semichemical pulp, because of its very high yield, should be very similar to groundwood in opacity, bulk density and stiffness. The freeness and strength characteristics of the semichemical pulp should be much higher than those of groundwood. From a paper making standpoint, the semichemical pulp should be superior to groundwood for newsprint manufacture.

A comparison of production costs for the two pulps cannot be made at this time because experimental data are not yet available. The semichemical pulp must be charged for chemical processing costs not incurred in mechanical pulping. The semichemical pulp must also be charged with a higher wood cost over that of groundwood. On the other hand, power costs for defibering the semichemical pulps will be much less than the power cost of grinding the mechanical pulp. As yield of semichemical pulp increases, chemical processing and wood costs will decrease, but power cost for defibering will increase. It is quite possible that experimental research will show that semichemical pulps can compete on an economic basis with groundwood in the production of newsprint.

Such a development would be of great importance to the paper industry. There is need for great increases in tonnage of newsprint. Any large expansion of this industry cannot use the conifers as raw material without causing a substantial increase in the price of wood. Semichemical pulps would make use of the hardwoods, already in overabundant supply. Color, hardness and size of the hardwood logs are not too important in semichemical pulping, since neutral sulfite liquors improve color and the chemical processing overcomes hardness difficulties. Thus, a wide species of hardwoods, such as the poplars, gums, oaks, etc., could be utilized.

The foregoing discussion is an example of how the information resulting from fundamental research can be adapted to existing processes for increased efficiency. The preshredding of chips before cooking was originally developed for high-speed continuous cooking but has an immediate application to standard batch cooking of high yield kraft and semichemical pulps. Further research into the use of the described methods for semichemical pulping may show that use of the hardwoods in newsprint is economically practical.

Increasing quality and production in sulfite pulping

GEORGE H. McGREGOR
Minnesota & Ontario Paper Co.
International Falls, Minn.

▶ In Ca-base sulfite pulping, more consideration should be given to high-yield sulfite pulps which—as practically demonstrated—can be used satisfactorily as the long-fiber constituent of newsprint furnish.

▶ Converting an existing Ca-base sulfite mill to Mg-base sulfite pulping involves such a high capital expenditure that the advantages of converting to sulfite pulping should be fully considered.

▶ The ammonia-base method—with or without liquor recovery—presents decided advantages as a means of increasing productivity.

TWO VERY DEFINITE INFLUENCES probably dictate greater expansion and production in kraft pulping facilities over that of acid sulfite pulping; notably, the adaptation of the kraft pulping process to utilization of practically any wood species, along with complete recovery of chemicals and heat from spent liquors; and the very trying technological problem of disposal of spent liquors from regular acid sulfite pulping.

Thus, in further expansion of production facilities for acid sulfite pulping, management is faced with a number of avenues, each of which entails complex economic and technological problems related to specific production areas.

Should an existing mill expand as is, with little or no consideration about spent liquor disposal; should it change to a soluble base cooking liquor that permits recovery of base chemical and heat from the spent liquor; should it change to a soluble base cooking liquor that permits recovery of part of the base chemical and heat from the spent liquor, or should it abandon the sulfite mill and purchase pulp or convert wholly to the kraft pulping process? As stated, each management decision entails serious questions of economics and technology. It seems fairly safe to assume that the immediate present course will result in nominal increases in acid sulfite pulp production by reasonable expenditures for increasing production by existing facilities and possible reasonable changes in technological procedure to fit certain organizations.

Calcium bisulfite pulping

In consideration of the general question of increased acid sulfite pulp production, let us first consider the normal mill using regular calcium base acid and producing maximum tonnage. An additional digester along with other necessary facilities may be added provided there is no question as regards disposal of the increased spent liquor. It is well known of course that addition of another digester may affect all auxiliary equipment from boiler house to final screening. In some instances slight increases in production can be obtained by decreased cooking time and higher maximum cooking temperatures, but such increases are usually slight, resulting in increased wood consumption and cost, and may likewise materially affect pulp quality. In view of the fact that the greater tonnage of acid sulfite pulp is bleached, any changes in cooking technology should be carefully analyzed in terms of quality.

Since a reasonable tonnage of acid sulfite pulp is utilized in the unbleached state (such as newsprint, many groundwood sulfite grades, and some packaging materials), complete consideration should be given to production of high yield pulp as a means of increasing production, at the same time resulting in further utilization of forest resources available. Auxiliary refining equipment must be purchased and other minor alterations or additions made, but such expenditures can be amortized in very reasonable periods due to wood savings. It has already been practically demonstrated that newsprint can be satisfactorily manufactured using 65 per cent yield sulfite pulp as the long fiber portion of the furnish.

Magnesium base sulfite pulping

One acid sulfite pulping mill has been in successful operation for some time and another is being built in which use is made of magnesium base acid, permitting practically complete recovery of base chemicals and heat from the spent liquors. Such a process offers a definite procedure for expansion in the field of acid sulfite pulping with satisfactory handling of waste liquors, although the process may not permit complete satisfactory utilization of all wood species, especially the highly resinous type. It is recognized that conversion of an existing sulfite mill to magnesium base pulping with complete recovery of chemical and heat involves a very sizeable capital expenditure. The cost might be such as to warrant careful analysis of a given situation in the light of conversion to kraft pulping versus magnesium base sulfite.

Ammonia base sulfite pulping

Considerable attention in the past few years has been given to conversion of an acid sulfite mill from calcium base to ammonia base acid. A few mills have found it very advantageous to make this conversion, with or without recovery of a part of the chemical and heat from the spent liquor.

It has been demonstrated that ammonia base sulfite pulping permits greater digester production due to shorter cooking time of up to 20-25

per cent. Easier more complete penetration of the chip, resulting in more uniform pulping, gives increased yields of pulp from wood, at the same bleachability, of up to 5 per cent. More uniform cooking and penetration results in material decrease in screenings. A decrease in "combined test" in the cooking liquor permits decrease in sulfur consumption up to 40 lb. per ton of pulp. Thus, for a given organization, it might be of decided advantage to convert from calcium to ammonia base acid as a means of increased sulfite pulp production. Ready absorption of SO_2 gas by ammonia and decided decrease in pulp screenings obviate necessity for increase in auxiliary equipment. Should a spare boiler be available, it could be converted to recover a portion of the sulfur and approximately sufficient heat required for spent liquor evaporation. To date there does not appear to be an economical method for recovery of the ammonia.

Ammonia base acid pulping permits wider utilization of wood species. Pulps from normal species require slightly less bleach consumption at given permanganate numbers. They appear to contain less pitch substance. Strength characteristics are not greatly different from those of normal calcium base acid.

Specific operating advantages in the use of ammonia base versus calcium base acid for sulfite pulping include:

(1) Ease of raw materials handling, labor in unloading stone into storage pile and charging into towers would be eliminated.

TABLE I

Comparison of Chemical—Rough Wood—Labor Cost Per Ton—CA-Base Vs NH_3-Base —Unbleached Screened Normal Yield—Bleachable Sulfite

	Material Cost FOB Mill	Unit Req. Per Ton Pulp	Using Cal. Base Acid	Using NH_3 Base Acid
Sulfur	$ 35.00	225# Cal. 185# NH_3	$ 3.93	$ 3.23
Limerock	6.20	325# Cal.	1.00	
Ammonia	120.00	90# NH_3		5.40
Wood	30.00	2.250 Cds-Cal. 2.144 Cds-NH_3	67.50	64.32
Opr. Labor			4.00	3.37
Total Cost			$76.43	$76.32

(2) Tower lining damage is eliminated, and there are no cores to be cleaned from grates.

(3) Acid quality is improved, absence of sludge in the acid reduces wear on pumps.

(4) Efficiency of tower packing is much higher, permitting higher free SO_2 and less loss of exit gas from tower.

(5) Condition of digester equipment is better, total absence of scale-forming compounds eliminates strainer scale, blow nozzle scale, indirect heat scale, and blow pit bottom scale.

(6) The pulp washes free from liquor more readily, and screens better due to less foam.

(7) The waste liquor is free from scaling tendency and may be evaporated at lower cost.

(8) The ash content is about 1/10th that of calcium base liquor.

(9) The concentrated liquor is well suited for furnace combustion with recovery of heat and chemicals.

Assuming that an existing acid sufite mill management might desire to change from calcium to ammonia base acid as a means of materially increasing pulp production without chemical or heat recovery, we have made a tabulation of chemical, wood and operating labor cost per ton of unbleached pulp as indicated in Table I. The figures are relative in character and may apply to most any of the existing areas of U.S. sulfite pulp production.

Despite the fact that ammonia base is materially more expensive than calcium base, the total cost of items listed is practically the same in each instance. If a high yield sulfite pulp is permissible for the organization, capital expenditures would be amortized in a very reasonable period of time.

Capital expenditures in conversion, as indicated above, should not be exorbitant, as practically all existing facilities could be utilized. The major expenditures would be for handling and storing anhydrous and aqua ammonia. In normal sequence, acid tower, accumulator, and digester linings would be changed to soluble base resistant materials.

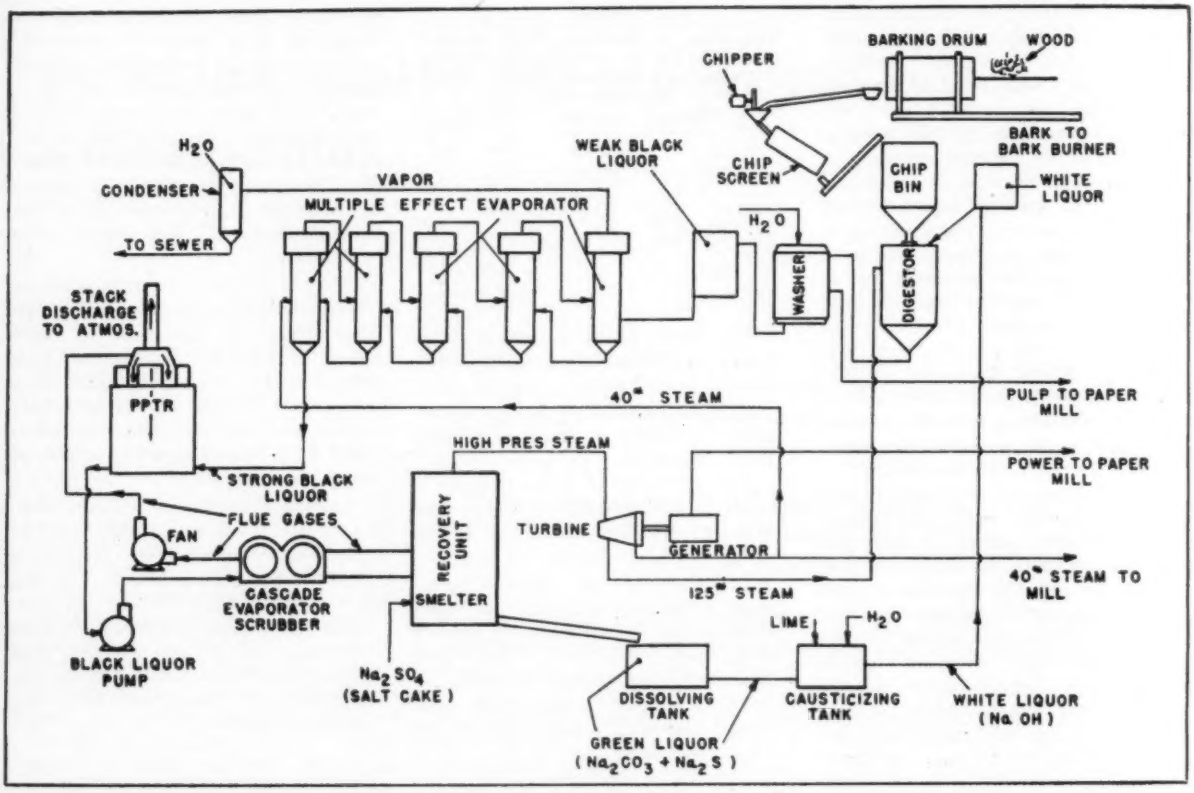
Sodium base sulfite pulping

The adaptation of soda base to acid sulfite pulping is still complicated by necessity for development of efficient economical means of recovery of the base from spent liquors. Possibilities of such recovery have and are receiving careful consideration from technologists within the industry and within the allied industry.

SULPHITE PULP YIELDS AND PULPING CHARACTERISTICS OF THE COMMON PULPWOODS AND OF SOME LESS-COMMONLY USED SPECIES (1)

Species	Density (moisture-free weight and green volume) Pounds per cubic foot	Moisture-free wood per cord(2) Pounds	Yield of moisture-free screened pulp: Per 100 pounds moisture-free wood Pounds	Yield of moisture-free screened pulp: Per cord(3) Pounds	Ease of pulping by usual procedures	Pulp characteristics: Fiber length	Color	Bleachability	Remarks
HARDWOODS									
Aspen	22	1870	49	855	No difficulty	Short	Light	No difficulty	Possible pitch
Beech	34	2890	44	1195	Slight difficulty	Short	Dark	Some difficulty	
Birch	34	2890	46	1250	Slight difficulty	Short	Medium	Slight difficulty	Possible pitch
Cottonwood	23	1950	49	900	No difficulty	Short	Light	No difficulty	
Maple	35	2970	45	1255	Slight difficulty	Short	Dark	Some difficulty	
Tupelo (gum)	30	2550	48	1150	No difficulty	Short	Light	No difficulty	
SOFTWOODS									
Douglas-fir	29	2460	48	1110	Heartwood difficult	Long	Dark	Heartwood difficult	Red-yellow color
Fir, balsam	21	1780	47	790	No difficulty	Medium	Light	No difficulty	
grand	23	1950	49	900	No difficulty	Medium	Light	No difficulty	
Hemlock, eastern	24	2040	44	840	No difficulty	Medium	Medium	Slight difficulty	
western	25	2120	47	940	No difficulty	Medium	Medium	No difficulty	
Larch, western	28	2380	---	-----	No difficulty	Medium	Medium	Some difficulty	
Pine, jack	24	2040	45	865	Some difficulty	Medium	Medium	Some difficulty	Pitchy
red	27	2300	45	970	Some difficulty	Medium	Medium	Some difficulty	Pitchy
southern	30	2550	47	1125	Heartwood difficult	Long	Medium	Heartwood difficult	Pitchy
white	22	1870	46	810	Some difficulty	Medium	Medium	Some difficulty	Pitchy
Red Cedar, western	19	1610	---	-----	No difficulty	Medium	Dark	Difficult	Red color
Spruce, black	24	2040	48	920	No difficulty	Medium	Light	No difficulty	Possible pitch
red	24	2040	48	920	No difficulty	Medium	Light	No difficulty	Possible pitch
Sitka	24	2040	49	940	No difficulty	Long	Light	No difficulty	Pitchy
white	24	2040	48	920	No difficulty	Medium	Light	No difficulty	Possible pitch
Tamarack	31	2040	---	-----	Heartwood difficult	Medium	Dark	Heartwood difficult	

(1) Average values for samples tested at Forest Products Laboratory; wide variations may occur within species. (2) Based on 85 cu. ft. per cord. Logs 4 feet long with bark on, stacked pile 4 feet high, 8 feet long. (3) Allowing 6% barking, chipping, and fiber loss



Flow diagram of a black liquor recovery system at Union Bag & Paper Corp.'s Savannah mill

Liquor and by-products recovery

THE MODERN LIQUOR RECOVERY units — largely instrument controlled — operate at a high degree of efficiency and, while they have become a must in the construction of every new sulfate mill, their cost of installation, about $1,500,000-$2,000,000, will rule against their addition to existing mills with a daily pulp output of less than 200 tons.

In the case of a Ca-base sulfite mills, the installation of a liquor recovery unit would further entail a complete revamping of operations from the washing point on.

The need has been expressed for more flexible recovery units. In this connection it was suggested that the installation of two smaller units instead of a larger one — the cost of which would be about 60 per cent more than that of a single large unit — might give the mill the flexibility it desires.

The first step in increasing the productivity of the liquor recovery system is to keep the brown liquor from the digesters as concentrated as possible. This is done by adopting the pressure-washing system, employing screw presses, which results in considerable reduction of the volume of water and hence in less heat consumption in the subsequent evaporating process. A three-stage pressure washing system, it has been reported, can recover 90-95 per cent of the brown liquor.

Corrosion is a serious problem in multiple effect evaporators. For this reason it is recommended that stainless steel tubes be used in the first effect evaporators. This will prove more economical in the long run, although the initial cost of installation of course will be much higher.

The development of wet-bottom electrostatic precipitators has simplified dust handling. It has also eliminated auxiliary equipment and maintenance costs connected with dry dust handling methods.

For increased efficiency, it has been suggested that the precipitator should be of the double-cell type — so that one cell can be shut off for repair

while the other is in operation. This would require the installation of improved bypass gates to permit a rapid switching over from one bypass system to the other.

Clean heating surfaces in the liquor burning recovery boiler are maintained through a fully automatic retractable soot blower which has greatly contributed to increasing the boiler's efficiency. Steam at 400 psi, for the hotter zones, and compressed air, at 275 psi for the cooler zones, are used in the retractable soot blowers.

In lime burning the trend is toward shorter and wider kilns. Lime-burning efficiency can be increased if flue gases are used to dry the filter mud before it enters the kiln.

Provisions should also be made to keep down and recover lime dust, which can be a nuisance in polluting the atmosphere, damaging transmission lines, and impairing paper quality.

By-products

Operations leading to the recovery of by-products are viewed more as a cheap way of disposing pulp mill waste than as a successful capital investment. Consequently, there is at the present no particular incentive for achieving greater productivity in by-products recovery.

The recovery of tall oil and turpentine, with a potential yield of 75 lb. tall oil and 2 gals. turpentine per ton of sulfate pulp, could be made more profitable if several mills were to integrate this phase of their operation with that of a single jointly owned recovery unit. Costs of production could thereby drop as much as 50 per cent.

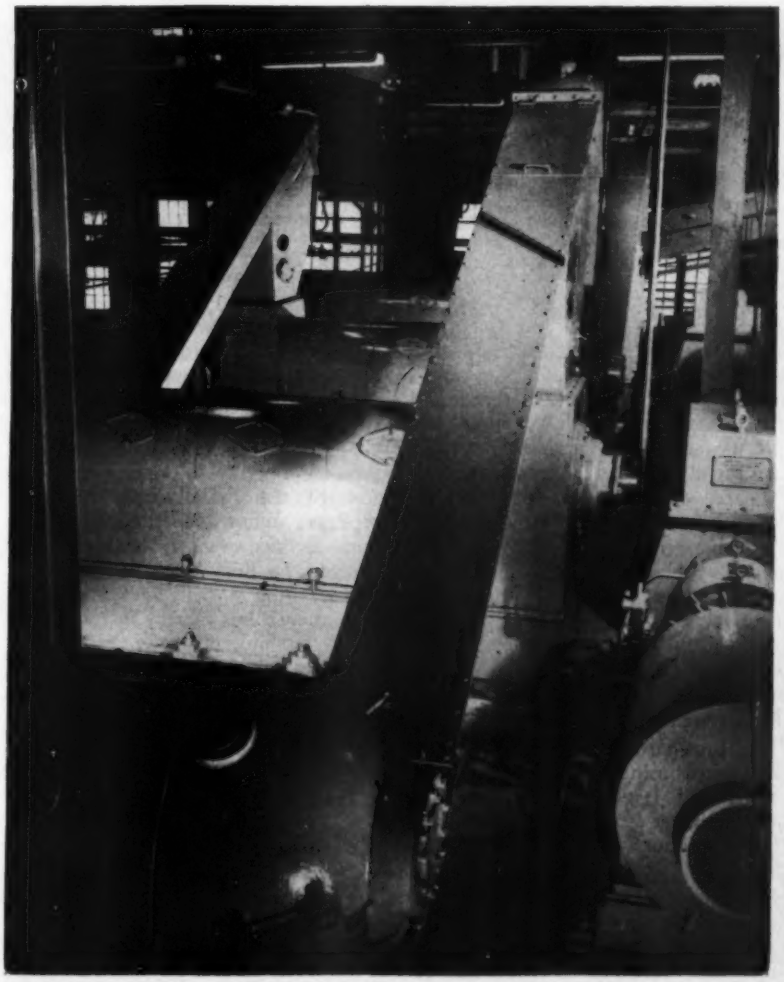
Pulp refining and stock preparation

ONE OF THE BASIC PROBLEMS in pulp refining and stock preparation is the screening of pulp. With the tremendous increase in paper machine speeds achieved during the past decade, screen rooms became one of the main bottlenecks limiting the mill's paper output because the out-moded screens simply could not keep up with the mill's production requirements. It is reported that there are still an appreciable number of 27-30 year old screens in operation. The No. 2 model Bird type screens still in operation and now at least 27 years old, alone, number about 600. To eliminate the screen room bottleneck many mills have replaced the old screens with high-capacity rotary type screens to insure the production of a paper stock that is clean, even in weight, and free of lumps, strings and slime.

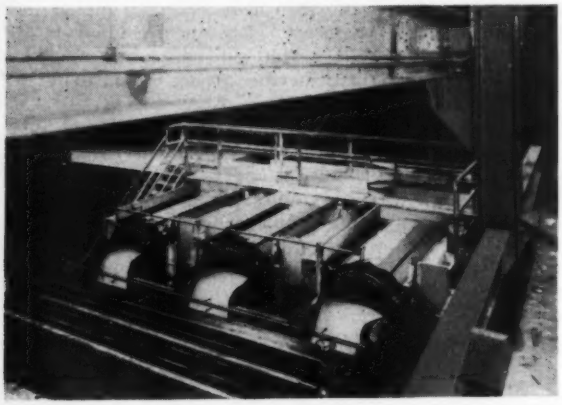
A few among the mills whose antiquated screen rooms prevented them from achieving a high degree of productivity tried to eliminate the screening operation altogether and rely entirely on the refining equipment for the production of a clean and uniform stock. In most such cases, however, complete, modern, and adequate screening operations have been resumed.

Segregating fiber into fractions

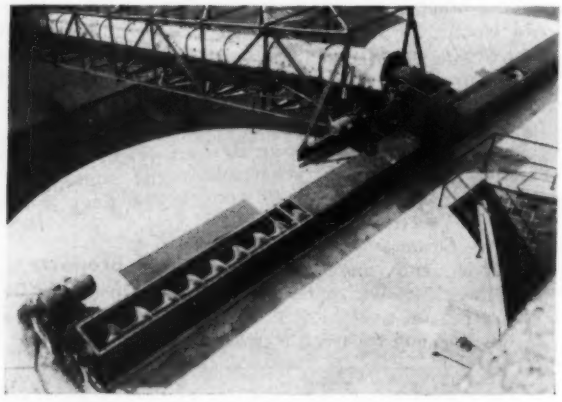
Since screens can perform the additional function of combing out and individualizing the fibers, they may play an even more essential role in the near future. The idea has been suggested that it might be desirable to integrate the pulping and stock



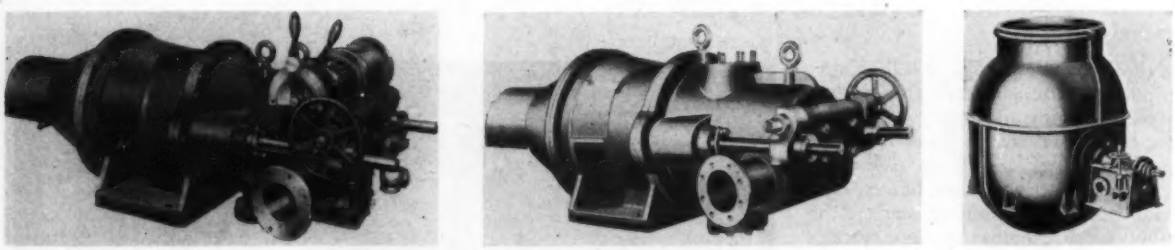
Sutherland press-washing system (made by Valley Iron Works) in operation at the American Box Board Co. Filer City, Mich. mill (courtesy Dale Rooks, Grand Rapids, Mich.)



View of modern high-capacity rotary-type Bird screens, the installation of which is eliminating proverbial screen room bottlenecks



High-density pulp storage tanks with Link-Belt inclined belt conveyor and Helicoid screw conveyor at the St. Regis Jacksonville mill



Left to right: Morden's "Stock-Maker" for beating, "Stuff-Maker" for jordaning, and "Slush-Maker" for pulping — for continuous stock refining

preparation operations and to individualize the fibers completely by separating them into various fractions by means of an extensive screening system. Any paper mill could then procure and blend these fractions according to its own requirements.

According to Richard Trelfa, Watervliet Paper Co., fiber properties obtained through blending of various fiber fractions are exactly duplicated in the beater curves, while inherent freeness properties are being retained through the elimination of the beater action.

Pulp washing

In brown stock washing the trend is toward using washers of slower speed and larger cylinder areas to achieve better recovery and lower dilution of liquor.

Screw press washers are becoming increasingly popular, and we shall undoubtedly witness considerable improvement in their design and performance. Their advantage is that of removing most of the liquor without dilution, which in the case of sulfate pulping has the added advantage of lessening the foaming problem. Water consumption, of course, is reduced considerably and so is the B.O.D. of the waste water.

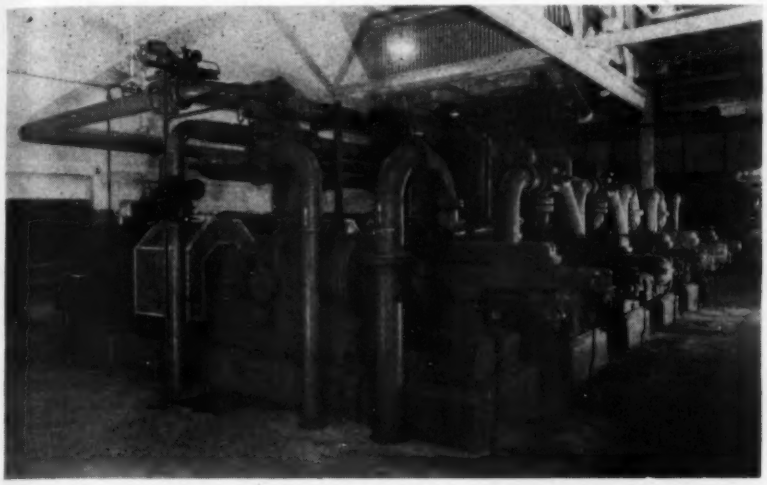
Some of the older mills have achieved increased productivity and lowered their maintenance costs by replacing antiquated cylinder washers with inclined washers of their own design. St. Regis Paper Co. at Kalamazoo, using 60 per cent waste paper, for instance, has thereby increased the mill's washing efficiency by 50 per cent and reduced maintenance by 95 per cent. Further streamlining here has resulted in the replacement of a beater with a Morden "Slush-Maker" — resulting in faster disintegration and improved brightness of pulp.

Refining

Each type of pulp, paper, or board furnish requires a different degree of beating and jordaning treatment to develop the desired properties of the furnish. A combination of equipment therefore is required to permit varying degrees of beating and jordaning. Where a mill's production is confined to standardized products, a single item of equipment may be designed to perform a combination of treatments.

Close attention to cooking methods, pulp selection and blending will tend to reduce the total amount of pulp refining required for most grades of paper and board. This in turn gives better drainage on the wire, permits faster machine speeds, and gives increased production and improved quality.

Increased production, as high as 10 per cent, has been reported by many mills through the use of Sutherland refiners, which have achieved wide popularity in recent years. The use of these refiners has also resulted in lowering maintenance costs and considerable saving in steam consumption in the dryer rolls. A recently developed unit, known as "breaker traps," is credited with a demonstrated ability to further de-fiber partially slushed pulps and reduce most of the wet strength broke to individual fibers. Power requirements are reported to be low, 1-2 hp per ton, and capacity is



Shartle Bros. team hook-up of jordaning and Hydrafining with Duotrol for automatic remote control

Improvements in high-capacity rotary screens, screw press washers, continuous refining, continuous high-consistency bleaching will continue to exert a dominating effect on increased productivity in stock preparation

high, 50-75 tons a day on the 12-in. unit and 125-150 tons on the 18-in. unit.

A marked trend — in line with the general advance to increased productivity — is the growing interest in high consistency pulp bleaching. Reports show that Jackson & Church Co. Roto-Pulpers have been highly successful in mixing the bleach and pulp on a continuous basis.

Team hookup—automatically controlled

While Shartle Bros. Hydrapulpers have been in operation for years (approximately 1400 of these units have been installed the world over) and have greatly contributed to high production pulping, we should like to refer to the reported high defibering, fibrillation and the cutting action achieved when a Hydrafiner and jordan are hooked up as a team to develop optimum strength characteristics of the fiber. Operated as a team, this equipment provides a greater stock treatment control and delivers longer fibers and a freer stock. This team hookup is particularly effective when the plug settings are controlled by Duotrol — a system of automatic and remote control — which causes the plug to move in automatically as the stock loses its harshness and becomes pliable and conditioned for fibrillation. Time savings of as much as 20 per cent have been achieved or, where necessary, 20 per cent more work has been done on the fiber within a unit of time.

The Duotrol system has been effectively linked with the suction couch vacuum. Suction couch control of the Duotrol system is based on the correlation that exists between the change in vacuum in the couch and the change in the freeness of the stock passing over the fourdrinier wire. An increase in vacuum causes the plug of the jordan to move out, thereby producing a freer stock.

Continuous stock preparation

Increasing interest is now being shown in continuous stock preparation systems where all pulp refinement is carried out by a combination of continuous beating followed by jordaning directly onto the paper or board machine. In such installations all pulp treatment can be directly controlled by the machine tender and any adjustments in the setting can be checked immediately for quality in the finished sheet. Morden Machines Co.'s equipment is designed to fit into a continuous-flow operation. It includes a "Slush-Maker" for pulping, the "Stock-Maker" for beating (from light brushing to heavy beating), and the "Stuff-Maker" for jordaning.

Metering equipment

Productivity in stock preparation is improved by the use of proportioning equipment to meter various grades of pulp stock (groundwood, sulfate, sulfite, etc.) in the desired quantities into the operating lines.

Automatic dilution systems eliminate the need for large tanks. In one case, the need for two 1,000-gal. high-alloy stainless steel tanks was eliminated through the use of an automatic dilution system, which reduced tank storage requirements to a single 500-gal. tank.

Controlled volume pumps for metering wet-strength resins and other chemicals are contributing their share to increased productivity.

What is urgently needed is the development of a means of delivering controlled consistency stock from high consistency storage systems, since there is a definite trend toward high consistency stock storage.

A meter is needed to measure stock flows. There is no device available to measure pulp contents in 5-6 per cent consistency stocks.

There is also a need for improved pumps to pump high consistency stock as well as high solids coating mixtures.

Semichemical Pulping

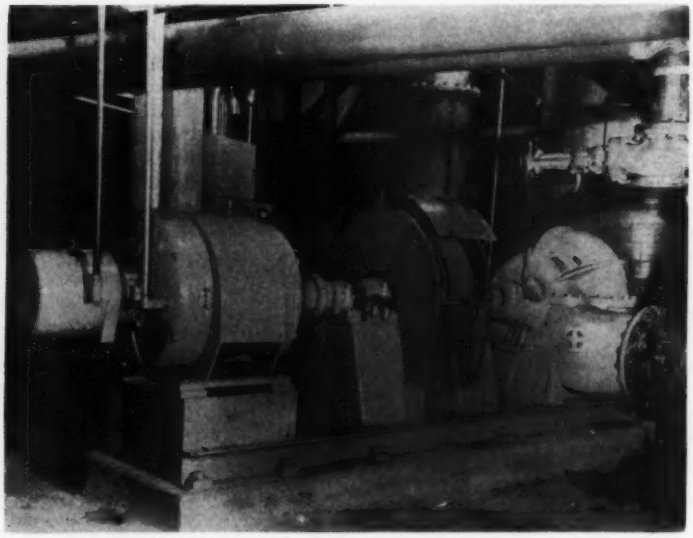
(Continued from page 147)

Sprout-Waldron refiners and then through Sutherland screw presses.

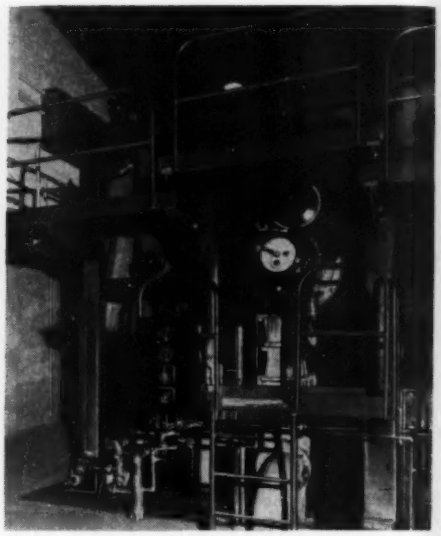
Two men operate the Pandia Chemipulpers from a Foxboro graphic control panel by remote control, with a daily output at Filer City of 290 tons of semichemical pulp.

A more complete description of the continuous semichemical process will appear in a subsequent article.

One of the main bottlenecks in semichemical pulping is the waste liquor disposal problem. Not having a high organic matter content, the waste liquor does not burn easily. However, much research work is being done toward a solution of this problem, and the National Container mill at Tomahawk has recently begun to recover its waste liquor from semichemical pulping. Other bottlenecks in semichemical pulping are uniform chip production, raw or cooked chip conveyors, chip charging, liquor preparation and storage, fiberizing capacity, screening and washing capacity.



The 20* Shartle-Miami Class A centrifugal fan pump, rated at 12,000 gpm against a total head of 36 ft., with an Electric Machinery automatically controlled magnetic coupling operated variable speed drive at American Box Board's mill at Filer City, Mich.



Suction return drum press, made by Black-Clawson, minimizes marking and crushing of the sheet; it is equipped with vertical stretcher, whipper, and felt adjusting mechanism; in operation at Manchester Board & Paper mill at Richmond

The paper machine

Deficient formation on the wire, the presence of air in the furnish, corrosion problems, and limited dryer capacity still remain important bottlenecks to maximum productivity.

WHAT SHOULD BE DONE to increase productivity on the paper machine? The first reaction to this question is that the modern paper machine already shows such a high degree of performance that there can be no immediate need for further improvements.

Indeed, much has been accomplished in recent years to make this machine the highly productive unit it is today.

What has been accomplished

We now have in general operation machines with speeds that a few years ago seemed improbable. We have machines with Rapi-Drape or with remote cantilever control, both designed for rapid wire change.

A system of variable speed drives has made it possible to achieve exceptional coordination of controlled speed between the various sections of the machine.

By way of a magnetic coupling variable drive we can have precise control of the fan pump delivering pulp stock to the pressure headbox equipped with manifold or cross-flow distributors. Savealls are designed to minimize cascading and consequent entrainment of air.

Automatic suction pickup rolls transfer the wet web from the wire to the dryer press, which is hydraulically controlled.

Anti-friction bearings and sludge removing lubricants permit high temperature and high speed operation of the dryer rolls.

The development of crownless press rolls has resulted in improved operation.

Bacterial damage to felts has been eliminated through the development of a number of chemical felt treatments which at the same time keep the felts in a soft and open condition, thereby prolonging their operational use.

The entire dryer is literally encased in a highly effective ventilation and moisture condensation system that aids drying and provides a high degree of comfort to the operator.

We have recording beta-meters that control the weight, thickness, and uniformity of paper as it passes over the rolls.

There are instruments and devices that control and record moisture content of the paper sheet as it goes into the size tub, passes over the size dryers, and as a finished product.

Valley Iron Work's pressure head box with stainless steel manifold, holey rolls, and adjustable lip slice (courtesy Dale Rooks, Grand Rapids, Mich.)

What still needs to be accomplished

1. A new concept of the wet ends of both cylinder and fourdrinier is needed that will give us still greater speed, better formation, and a less directional sheet.

2. The presence of air in the furnish is a serious bottleneck in papermaking. The addition of a flow box to the headbox improves this condition considerably. Streamlining the valves and pipe lines between the fan pump and the headbox will reduce turbulence and therefore result in less entrainment of air.

3. High-speed cylinder machines are needed. It is anticipated that cylinder machine speed will be increased to 800-1000 fpm within a few years.

4. Corrosion is still a big factor interfering with high productivity. Plastic valves and pipes, which currently are receiving much attention in the pulp and paper industry, are not made in sufficient quantity. Where metal pipes and valves are used, these should be lined with corrosion resistant materials to reduce maintenance. In this connection there is need for the development of plastic membranes and linings that will resist the attack of both alkalis and acids, as well as of chlorine dioxide.

5. There is room for improvement in the on-the-machine coating methods and equipment. Great developments along these lines are anticipated in the near future.

6. A continuous starch cooker should be developed for effective integration with the on-the-machine sizing operation.

7. Better methods of drying should be investigated and developed since the output of most mills is limited by their dryer capacity. In many cases, the mills' dryer capacity could be improved by the installation of some auxiliary drying equipment, such as infrared and convection current drying effected by both gas burners or electric heaters, as suggested in an article on "Drying Converted Paper Products with Radiant Gas Burners," published in the March, 1954, issue of THE PAPER INDUSTRY.

In this connection Dr. Reavis C. Sproull of the Herty Foundation reports excellent results in partly drying a glass paper web with electric heat at the end of the fourdrinier wire. This

was necessary to facilitate the transfer of the glass paper web to the press rolls.

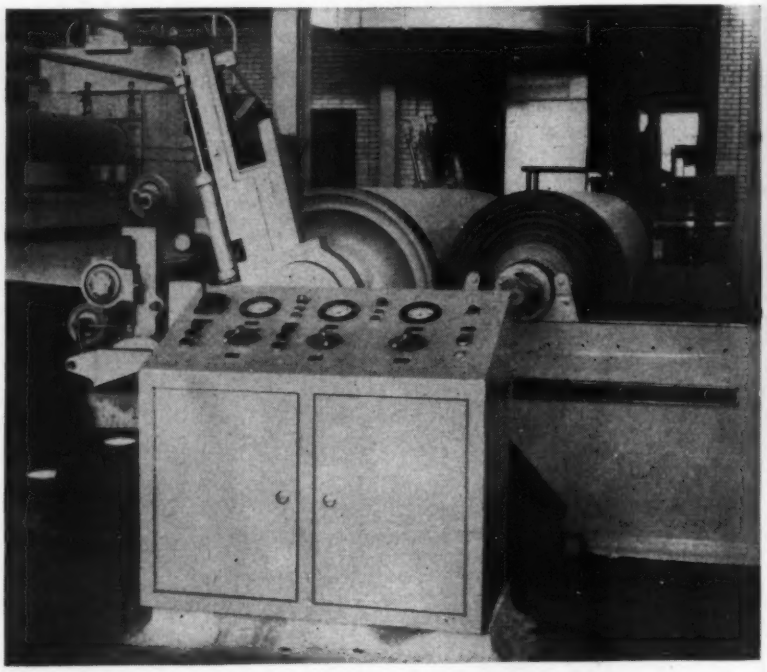
Partly drying the sheet on the fourdrinier also resulted in retaining an excellent sheet formation, since it was not subject to the same distortion on the press as in the case of a wet sheet. Dr. Sproull suggested that the same priniciple may find application in cellulose fiber papermaking.

8. Increasing the dryer capacity by other means, e.g. the addition of film-forming amines to the steam in the dryer rolls. The possibility of achieving a 10 per cent increase in drying capacity by this method was reported in a paper, "Film-forming Corrosion Inhibitors also Aid Heat Transfer," published in the April, 1954, issue of THE PAPER INDUSTRY.

Calendering and finishing

To increase efficiency and reduce maintenance on the calender, the need has been expressed for the use of better materials in calender roll construction, such as stainless steel for example. Another urgently needed development is some type of automatic feed system on the calender.

A new reel, which eliminates the handling of full rolls or of empty cores by crane or hoist, is now in operation at the American Box Board Co. Filer City mill. Operating by push button control, it automatically moves a full roll out of position and puts a new roll into position. The sheet is broken by means of a shower and jagger arrangement, whereupon the winding of a new reel begins. The reel winds—at high speed—tight even rolls of any diameter up to 96 in., while enclosed hydraulic cylinders provide uniform pressure of the roll against the drum.

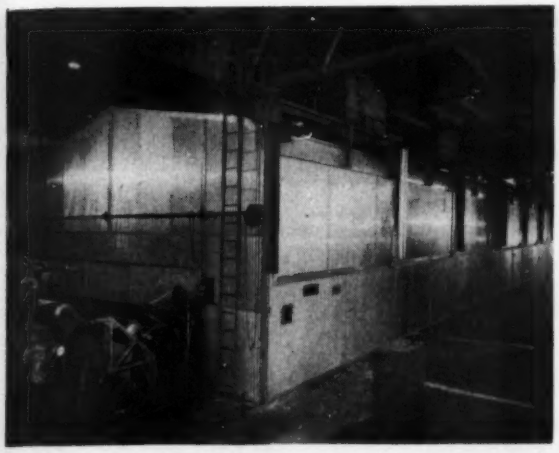


Hydro-flyte high-speed reel, push-button controlled, eliminates need for crane or hoist

An automatic roll wrapping machine—believed to be the first to be put into operation in the U.S.A.—will be used at the Bowaters Southern Paper Corp. mill.

In pulp finishing, there is need for a pulp-winder that will permit winding and shipping pulp in rolls instead of cutting it and shipping it as baled sheets.

New high-speed paper machine at the Scott Paper Company's Everett mill, featuring 200-in. fourdrinier, 90-ton Yankee dryer, and calender-rewinder



Completely enclosed Ross-Hooper hood, which has greatly contributed to increased productivity

New Ross automatic calender cooling system has adjustable nozzles that can be grouped and concentrated at any desired points

Air supply systems for drying and ventilation

WHILE THE PAPER INDUSTRY frowns at the presence of even minute quantities of air in the paper furnish, it uses air in tremendous volume for paper drying and ventilation purposes in the machine room. In fact, the air consumption in the machine room is 60-80 tons for each ton of paper produced.

The cost of heating, moving, and conveying such large volumes of air is surprisingly high. It is reported that one mill, with a daily output of 100 tons paper, spent as much as $4,500 a month on supplying the quantity of heated air needed for the removal of moisture from the paper sheet. With the installation of improved air supply systems — which are designed for maximum economy of air utilization — such cost can be reduced by more than 30 per cent.

A properly constructed hood will reduce the amount of air needed for paper drying by 20-25 per cent. This is achieved by making provision for ample gathering space under the hood where the humid air can accumulate and stratify before it is removed by the fans or exhaust stacks. The modern hoods are designed to permit the air to reach the maximum moisture saturation desirable.

While the main function of the hood and exhaust system is the drying of paper, the air supply system also contributes to increased productivity in the following ways:

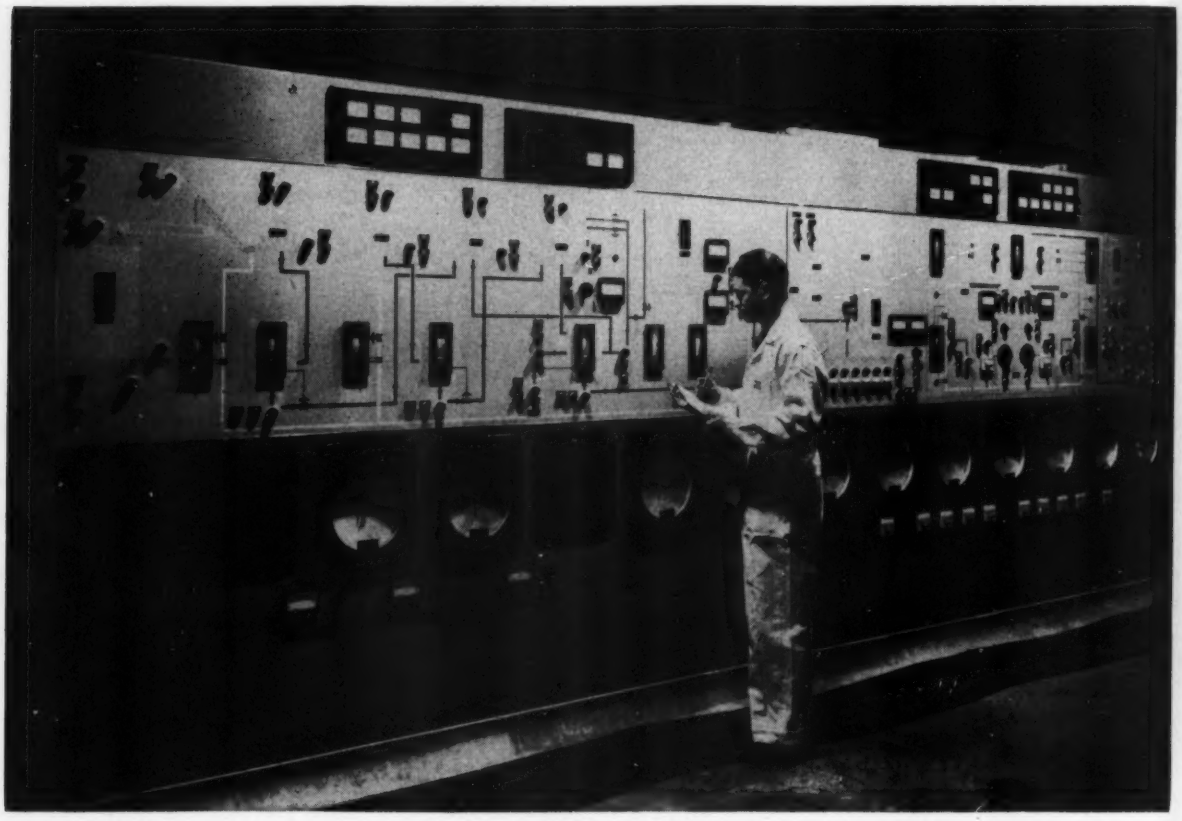
(1) It ventilates and heats the machine room to insure comfort and health for the operators.
(2) It prolongs the life of the dryer felts and preserves the building from premature deterioration.
(3) It cools calender rolls and electric motors.
(4) It handles trim and broke from the machine.

A most recent development in hood design is the completely enclosed type—as exemplified by the Ross-Hooper Hood—which, in conjunction with a high velocity felt supply system and double-pass economizers, has resulted in

(1) increasing the rate of water evaporation by 18-21 per cent;
(2) reducing air consumption by 39 per cent, and
(3) reducing steam consumption by 20 per cent.

In calender roll cooling devices, a new Ross automatic cooling system provides the high-pressure air cooling required by the modern high-speed paper machine. This system features adjustable nozzles that can be grouped and concentrated on any part of the roll, according to requirements. Each nozzle has remote-control air valves which can be operated by the tender in front of the mill.

The important improvement in pulp drying equipment is the provision of supplying externally rather than internally heated air. According to field reports, an efficient pulp feeding device for the pulp dryer still remains to be developed.



View of the Foxboro graphic control panel on which is portrayed graphically the entire continuous pulping and refining operation at American Box Board Co.'s Filer City mill (courtesy Dale Rooks, Grand Rapids, Mich.)

Instrumentation

▶ Instrument system engineering is based on an overall appraisal of plant operation — leading to integration of processes and automatic control

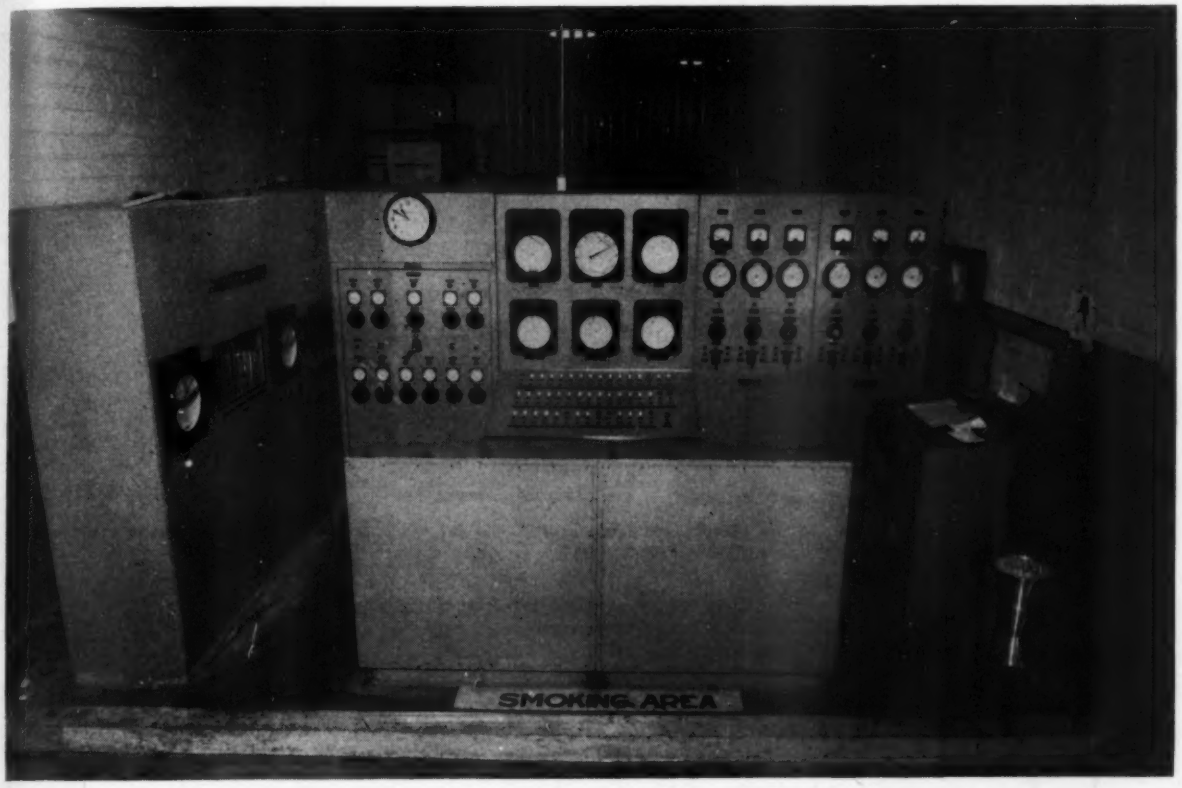
▶ Graphic control panels — showing in simplified flow diagram the entire operation of the process — are finding many applications in the pulp and paper industry.

THE PULP AND PAPER industry is becoming more and more dependent on automatic control instruments for uniform quality output and maximum productivity. The first step in converting to automatic control is to establish the operating values of all process variables at optimum productivity. After these values have been established for flow rates, temperatures, pressure, pulp consistencies, etc., instruments are selected or designed that will maintain them at all times.

The decision affecting the extent of instrumentation for any particular process or mill should be made from the standpoint of promoting general efficiency and lowering the cost of operation, rather than installing instruments in a haphazard fashion and singling out an individual variable to boost the performance of an individual piece of equipment.

To make such an over-all evaluation of the mill's requirements, instrument manufacturers are now providing a service termed "instrumentation system engineering" designed to increase productivity of the paper mill. The approach indicated by system engineering involves a comprehensive appraisal of the entire process and results in the integration of operating facilities, an essential prerequisite to achieving "push button" or automatic control. The system engineer, whether he is employed by the paper company or the instrument manufacturer, must be an instrument expert as well as a process expert.

The "nerve-center" of the instrumentation system is the instrument panel. As the number of control instruments in any one mill increases, the need arises for a graphic-type control panel on which the mill's process is illustrated in the form of a simplified flow sheet or diagram. The recording and control instruments used



View of the Black-Clawson push-button control panel from which are controlled practically all operations on the paper machine

on a graphic panel are generally of the miniature type, to save space and to give the operator the over-all conception of operations required to supervise the process adequately.

Advantages of the graphic control panel have been amply demonstrated — start-ups are facilitated and operator training time reduced; product quality is maintained; the operator can detect a change in process conditions and apply corrective measures immediately; there is less likelihood of upsets during start-up and shut-down, since the steps necessary for smooth operation are easily seen; operators, relieved of routine control duties, are available for more important tasks, etc.

Instrument system engineering, with or without graphic control panel, has been successfully used in such applications as pulp digester operation, stock washing, bleaching, liquor recovery—as shown by some of the following examples.

Digester operation at Mead's Chillicothe mill

All feeding from the chip bin, weighing, and conveying equipment is controlled from the digester room. Except for opening and capping the digesters, loading and cooking is almost entirely a push-button and instrument operation.

At the glass-enclosed control panel, the operator selects the digester to be filled, sets the weight of chips to be supplied, selects the twin screw feeder for softwood or oak, and directs the shuttle conveyor which feeds the chips.

All machinery is interlocked, so that exact sequence of operation is maintained and filling operation is shut down in reverse sequence when the weightometer indicates that the correct quantity of chips has been supplied.

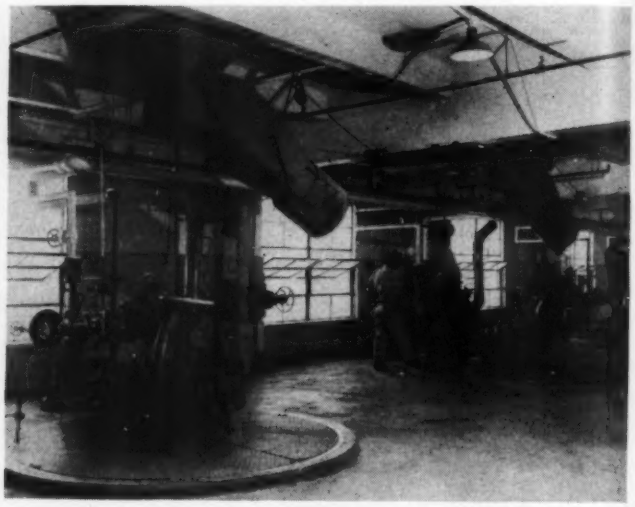
Liquor is metered into the digester by a Foxboro automatic liquor measuring system.

ABB Co's continuous semi-chemical pulping

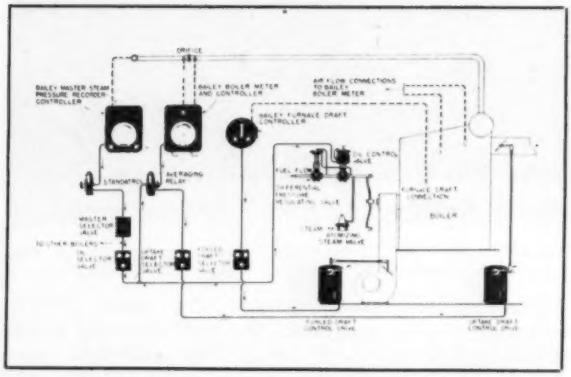
One of the highest instrumented installations in this country is the continuous semichemical pulping process of American Box Board Co. at Filer City, Mich. A graphic control panel, furnished by the Foxboro Co., includes all instruments and remote controls to make the entire pulp mill operate from one position. The panel portrays graphically the entire operation on the panel face. The individual lines covering steam, water, liquor, etc., are shown in different colors for easy identification. Inserted on the different pieces of equipment are such things as level indicators in the chip hoppers, blow tank, intermediate pulp tank, high density storage tank. Variable speed controls are placed on the panel adjacent to, or close to, their respective operating equipment. Tachometers indicating variable speeds in relatively the same position and flow meters are inserted in the piece of equipment utilizing the liquids involved or relatively close to them. Start and stop button positions are generally adjacent to the piece of equipment to be operated.

Instrumentation on the paper machine

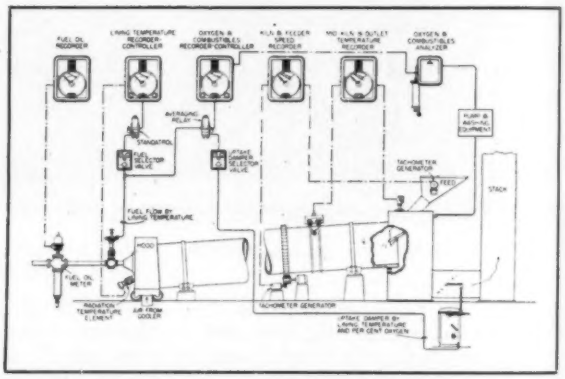
As far as is known, no graphic control panel is in use to control the operations on the paper machine, but there is no question that this application offers intriguing possibilities and a challenge to the instrument manufacturer.



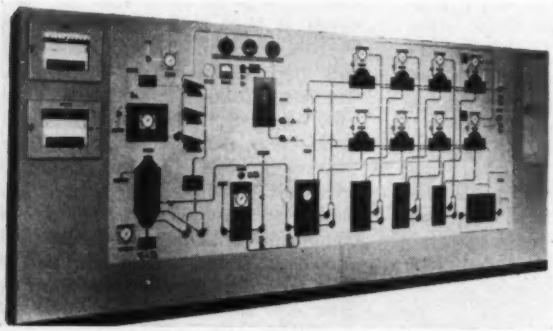
Loading floor of the digester building at the new Mead Corp. pulp mill at Chillicothe, Ohio, where the entire digester operation, loading, cooking, and blowing, are automatically controlled from control panels



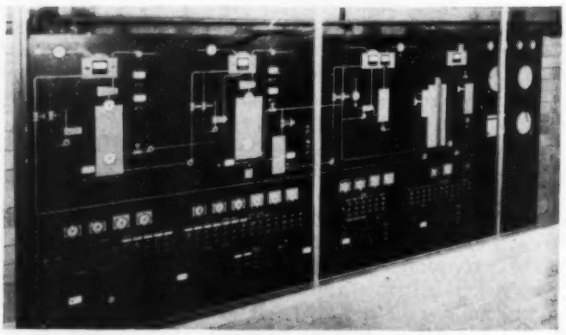
Bailey combustion control system applied to oil firing



Schematic layout of Bailey control for natural draft oil-fired kiln



Minneapolis-Honeywell graphic stock washing control panel



Minneapolis-Honeywell graphic bleach plant control panel

Apart from the increased productivity resulting from applying instrument-control to paper stock flow onto the wire, suction vacuum in the couch roll and in the press, felt tension, machine speed, steam pressure and temperature in the dryer rolls, and, more recently, producing a paper sheet of uniform thickness by means of the beta meter, special mention should be made of an automatic control system for maintaining the exact moisture control desired in any type of paper or paperboard.

This automatic control system, developed by Stickle Steam Specialties Co., is in operation at Newton Falls Paper Mill Inc.

The moisture content of the paper sheet is determined by a tension roll assembly installed at a strategic point

in the dryer section. A slight change in moisture content here acts quickly on the tension roll which, linked to a diaphragm motor valve located in the steam supply line, causes the latter to increase or reduce the steam supply to the dryer rolls according to requirements. An instrument panel records or indicates steam pressure in the dryers, moisture variation in the sheet, and time and duration of each wet end break.

Automatic steam generating

An important, yet often neglected, factor in increasing the productivity of a pulp and paper mill is the efficient control of unit-generating steam, both for power and process use. Automatic combustion and feedwater control on power and recovery boilers and automatic firing of rotary kilns offer a way to meet the demands for increased high quality production.

As a specific example of what can be done along these lines, the following is a description of the instrumentation supplied by Bailey Meter Co. for a new paper and pulp mill in Georgia:

The power boiler is equipped with combustion controls, including a master steam pressure recorder-controller which controls the fuel and air going to the boiler. A boiler meter operating a steamflow-airflow controller continuously maintains optimum excess air by automatically adjusting uptake draft. The forced draft is controlled by a furnace draft controller. A drum level recorder-controller and a feedwater flow meter work in conjunction with the steamflow mechanism of the boiler meter to complete the three-element feedwater control system.

The recovery boilers which burn black liquor, with oil as an auxiliary fuel, also use the boiler meter as a combustion guide. Fuel oil flow is controlled from the control panel by remote manual relay, as is the forced draft. Induced draft is automatically adjusted by furnace draft controllers.

The bark-burning boiler has combustion control and three-element feedwater control similar to that used on the recovery boiler.

The instrumentation applied to the lime kiln provides continuous comprehensive information on kiln operation. An oxygen analyzer indicates and records the oxygen content of the kiln gases; an electronic type lime kiln temperature instrument indicates and records lime kiln temperature and gas outlet temperatures; an electronic type flow meter records and indicates oil flow, and a draft controller indicates and records hood draft.

Black liquor recovery

In black liquor recovery, as practiced at Mead's Chillicothe mill, the operation of the mutliple stage evaporator is fully controlled by Foxboro instruments. A boiling point rise controller keeps a continuous check on solids content in the liquor and regulates the flow of feed liquor to keep the solids content constant in the output liquor. A pressure controller regulates the rate of evaporation by metering the steam going to the first effect. Temperatures at 20 different points throughout the evaporator system can be checked by means of an indicator.

Bleaching

The three-stage bleach system shortly going into operation at Bowaters Southern Paper Corp. in Tennessee is continuous and fully automatically controlled.

Acknowledgments . . . . .

The editor expresses his thanks to all those in the pulp and paper industry whose invaluable comments on specific items have contributed to the completion of this focus issue. Special thanks are due to:

Benton R. Cancell, Vice President for Production, Rhinelander Paper Co., Rhinelander, Wis.

H. P. Carruth Jr., the Mead Corp., Chillicothe, Ohio

D. C. Everest, Chairman of the Board, Marathon Corp., Rothschild, Wis.

F. F. Frothingham, Vice President, Bird Machine Co., South Walpole, Mass.

J. C. Freyberg, Panellit Inc., Chicago, Ill.

M. J. Goloff, Plant Engineer, St. Regis Paper Co., Kalamazoo, Mich.

W. H. Haselton, Technical Director, Rhinelander Paper Co., Rhinelander, Wis.

L. J. Kaiser, Bailey Meter Co., Cleveland, Ohio

J. A. Kenney, Oliver United Filters Inc., New York, N.Y.

B. W. Martin, Manager of the Filer City Mill Div., American Box Board Co., Filer City, Mich.

J. N. McGovern, U. S. Forest Products Laboratory, Madison, Wis.

G. H. McGregor, Minnesota & Ontario Paper Co., International Falls, Minn.

W. K. Metcalfe, J. O. Ross Engineering Corp., New York, N.Y.

R. Burke Morden, President, Morden Machines Co., Portland, Ore.

D. G. Moon, J. E. Sirrine Co., Greenville, S. C.

Dr. William J. Nolan, Professor of Chemical Engineering Research, University of Florida

W. W. O'Hara, Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.

George Olmsted, Jr., President, S. D. Warren Co., Boston, Mass.

Dr. Arthur Pollack, Consulting Engineer, New York, N.Y.

John Procopi, Milton Roy Co., Philadelphia, Pa.

A. L. Sherwood, Vice President, Sutherland Paper Co., Kalamazoo, Mich.

Dr. Reavis C. Sproull, President, Herty Foundation, Savannah, Ga.

F. A. Stickle, Stickle Steam Specialties Co., Indianapolis, Ind.

Lionel M. Sutherland, Sutherland Refiner Corp., Trenton, N. J.

Hayden A. Taylor, Shartle Bros. Div. of the Black-Clawson Co., Middletown, Ohio

R. T. Trelfa, Technical Director, Watervliet Paper Co., Watervliet, Mich.

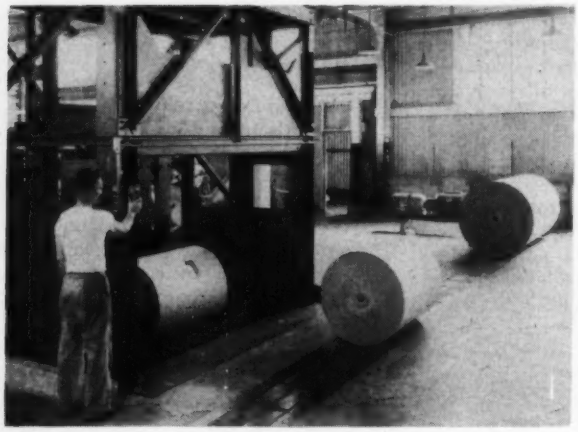
D. L. Voigts, Manager of the Technical Department, Filer City Mill Div., American Box Board Co., Filer City, Mich.

R. V. Weldon, Vice President for Engineering and Research, Great Northern Paper Co., Bangor, Maine

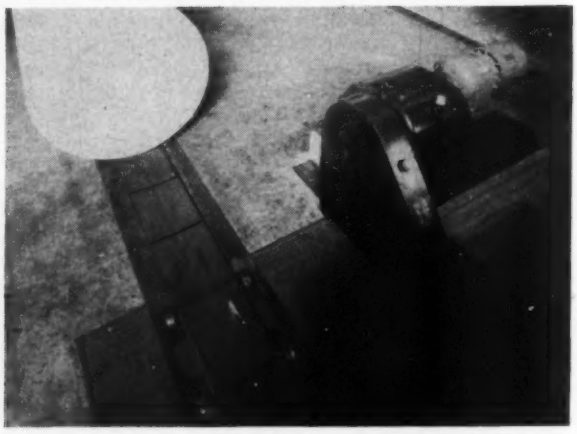
John C. Wood, Vice President, Kalamazoo Vegetable Parchment Co., Kalamazoo, Mich.

In line with our policy to round out the publication of information leading to increased productivity, we invite constructive criticism of this issue as well as contributions of articles dealing with specific equipment or operations that will result in increased productivity in the pulp and paper industry.

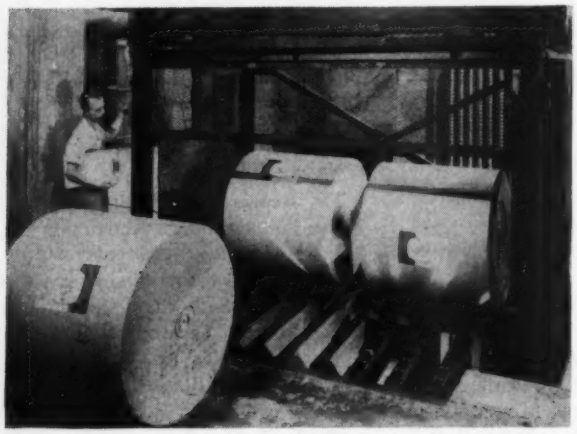
Well-planned and streamlined handling of products results in increased productivity



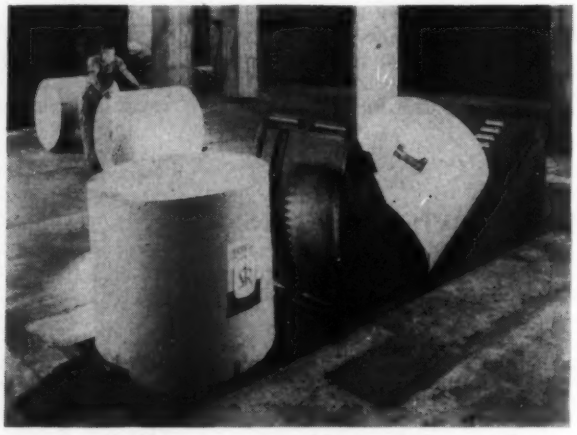
Link-Belt double strand roller chain pallet conveyor, riding flush with floor, brings paper rolls to skip type lowerer for delivery to shipping floor; the operation is controlled by push-button



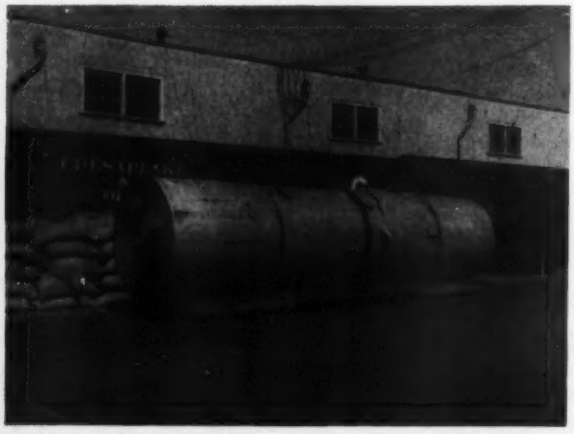
The double strand roller chain pallet conveyor is operated through a head shaft by a 7.5 hp Electrofluid drive, enclosed herringbone gear, and precision steel roller chain



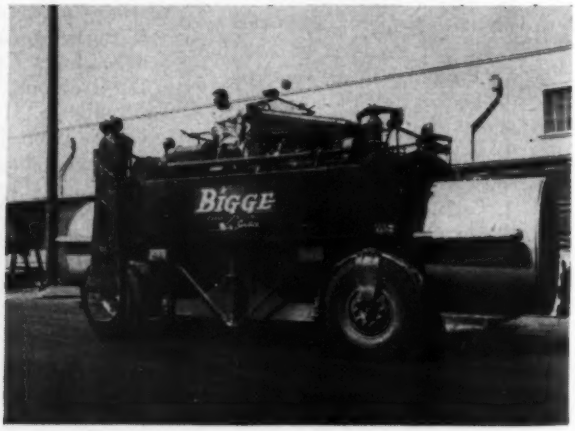
Rolls are discharged from the Link-Belt lowerer on shipping floor



A Link-Belt motor-operated upender brings paper rolls to an upright position



View of a long Hyster Co. skid designed for receiving and holding four large rolls of paper that will be transported as a single unit by a straddle truck



Huge straddle-type Hyster truck has picked up a skid with its load of four rolls of paper; such trucks are usually geared for a maximum speed of 30 mph around the mill; for highway service, provision may be made for speeds up to 55 mph

This year, **BEER** *will be served* in the nation's ball parks in paper cups which have been undergoing development for *10* years to find the proper combination of paper, coatings and finishes capable of preserving, in full, the flavor and "head" of beer.

THE OILED PAPER BAGS used by Japanese tea-growers to hold tea leaves, often were used and reused for many years. Instead of tossing torn bags away when they wore through, they patched them and kept right on using them. . . . . .

The Establishment

of America's first paper mill- operated near Philadelphia by Wm. Rittenhouse from *1690* on – probably was hastened by the difficulty of William Bradford, Philadelphia printer, in getting "on time" shipments from France, Germany and England.

Oil Bits

In the early 1800's, English papermakers converted course brown rags into "white" paper by passing through the pulp in water a mixture of manganese and oil of vitriol.

A Job To Do

ARTICLE II of the Constitution and By-Laws of The American Pulp and Paper Mills Superintendents Association sets up a four-fold purpose for the organization. Here it is:

"A. To promote discussions of practical and professional matters pertaining to the pulp and paper industry in so far as such matters may be discussed without conflicting with the established policies of mills.

B. To assist in the solution of problems confronting the industry.

C. To organize local divisions of the Association as needed so that divisional members may periodically meet, discuss their common problems, and listen to informative talks on matters which will help them to perform their respective duties in a more efficient manner.

D. To disseminate practical and helpful information on various phases of industry activity."

The program of the 35th Annual Convention has been worked out with the above four-fold purpose in mind. The several sessions — two general sessions and six group meetings — have been planned to evoke discussions, to aid in the solution of problems, and disseminate practical and helpful information.

There will be talks by leaders in the field of supervisory responsibility; papers on newer developments covering paper machine operation; a progressive coverage of high-yield pulping; a paperboard meeting of most effective proportions; an approach to engineering and maintenance subjects which is very practical; and a broad handling of chemical pulping and other segments of pulp and paper making technology and operation.

Mr. PULP and PAPERMAKER: Do you want to know more about pulp and papermaking? If you still have the urge to learn, make arrangements now to attend the 35th Annual Convention of The American Pulp and Paper Mill Superintendents Association.

The dates for the meeting are June 21-23, 1954. The place of the meeting is the Sheraton-Mt. Royal Hotel, Montreal, Canada.

Do not delay decision. Write or wire your hotel requirements today to Charles E. Smith, Montreal Tourist and Convention Bureau, Dominion Square Building, Room 923, Montreal 2, Canada.

Advertisement —

The American Pulp and Paper Mill Superintendents Association

327 South La Salle Street

Chicago 4, Illinois

COLOR PHOTOGRAPH BY JOHN S. HOLYOKE

216" BELOIT MACHINE built for West Virginia Pulp and Paper Company's mill at Covington, Virginia. Efficient production of high-quality food-container board is helped by features such as air-cushioned headbox, specially designed press section, air guides for wire and felts, heavy-duty pneumatic reel, and high-speed shear-cut winder. The Beloit Differential Drive holds accurately selected draws without variation, thus raising sheet tests and sharply cutting machine breaks.

better felts...

through...

Research

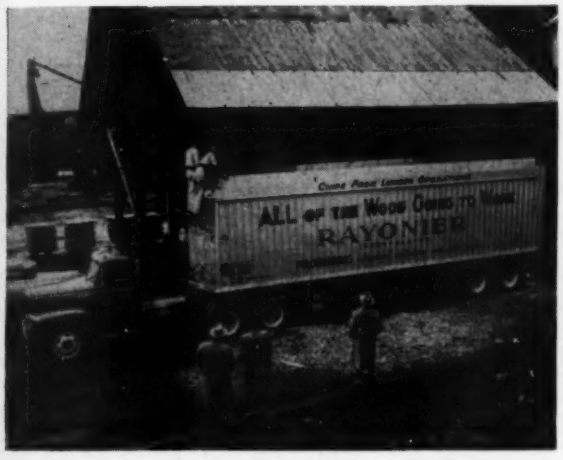
The quality being built into Appleton Felts today is predicated very largely on determinations arrived at through the work of a nationally recognized independent research laboratory organization.

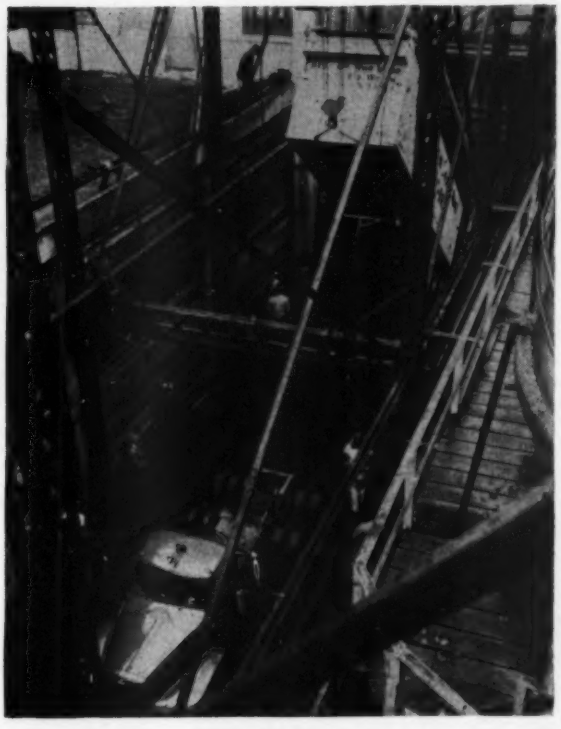
Appleton Felts make good paper.

APPLETON WOOLEN MILLS
APPLETON, WISCONSIN

1954

The Paper Industry News of the Industry





No Longer Wasted . . .
Complete utilization of raw material is the goal of Rayonier Inc.; in its State of Washington operations a fleet of 16 Fruehauf trailers transports spruce chips from the lumber mills to the pulp plants; owned by Puget Sound Truck Lines, the open-top units have an over-all height of 12 ft. 6 in., are 35 ft. in length and boast a 21-ton payload.

Above, the lumber mill crew loads wood chips by means of elevated hoppers; the unloading operation (right) is accomplished by raising the trailer with a chain fall so that the load is dumped from the rear and fed directly into the plant's production line.

Ketchikan Ready for Operation

The $50,000,000 Ketchikan Pulp Co. mill near Ward's Cove, Alaska, was to go into production May 1. The project is a joint venture of Puget Sound Pulp & Timber Co. and American Viscose Co.

Ketchikan—the territory's first pulp mill—has a rated annual capacity of 130,000 tons of dissolving pulp. (As a matter of comparison, the Bellingham, Wash. plant of Puget Sound Pulp & Timber produces 145,000 tons per year; however, this output is comprised of paper grade pulp, while the Ketchikan product will be used in the manufacture of rayon yarn for various purposes, including cord for automobile tires.)

Ketchikan's output will go east to American Viscose plants in Pennsylvania and Virginia. The pulp will be shipped by car ferry to Prince Rupert, B. C., where it will be picked up by Canadian National Railways to be carried to a U. S. point of entry.

Lawson P. Turcotte, president of Puget Sound, says that under present plans American Viscose will take 100,000 tons of the annual production, with the remaining 30,000 being disposed of on the open market.

In back of the big project is a timber reserve of 8 billion bd. ft., or that part of the vast Tongass National Forest set aside by the USFS to provide Ketchikan with a perpetual backlog of timber. The reserve consists of 75 per cent hemlock, 20 per cent spruce and 5 per cent cedar.

•

Wrenn Plans Expansion

A paper machine rebuild has been announced by Wrenn Paper Co. of Middletown, Ohio. While the project will increase production, it will also aid the firm in working out the development of new grades and in more closely controlling the quality of those now in production. The report was issued by J. J. Hallowell, president.

According to Mr. Hallowell, "We are manufacturers of high quality papers, and the demand for the very close control of the various qualities that are required in these times is becoming more and more rigid. Therefore, to meet this requirement we are constantly improving our means of complying with such a demand."

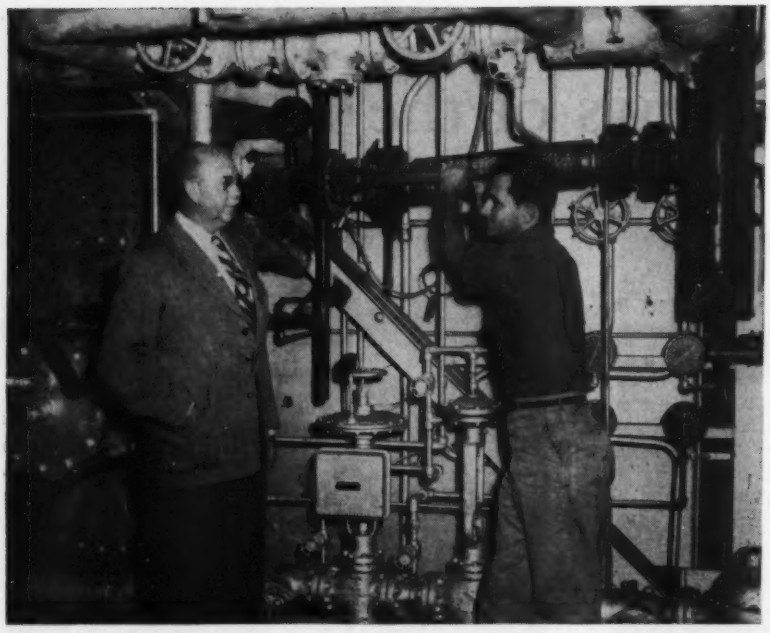
Wrenn has already purchased and received the equipment necessary for the change. Supplying the equipment was the Black-Clawson Co. of Hamilton, Ohio. It will be necessary to extend the paper machine building, and the contract for the construction project is to be let in the near future.

•

New Rayonier Project Will Aid in Wood Conservation

An addition to the woodmill at the Port Angeles (Wash.) Div. of Rayonier Inc. is being constructed at a cost in excess of $1,000,000. According to Harry A. Thurlow, resident manager, the project will "effect substantial savings in wood for chemical cellulose production."

Mr. Thurlow declared that such new wood savings "will materially extend the timber resources available to the three Rayonier plants in the



NECESSARY ADJUSTMENTS are made at the Savannah, Ga. plant of Union Bag & Paper Corp. in the firm's recent switch to natural gas; the new fuel is being used in the three largest power boilers and all lime kilns; the daily consumption is approximately 34,000,000 cu. ft.; the three boilers produce 56,000 to 60,000 kw hrs. of electricity; above, C. C. Bush, superintendent of the power department, looks on as Forrest McIntosh makes adjustments on No. 10 boiler

Northwest." (The firm controls 382,750 acres of timberland in the area and 462,550 acres in Florida and Georgia.)

A two-story 5,700-sq. ft. building is being erected to house a new ring type hydraulic barker capable of handling logs up to 36 in. in diameter on a continuous basis. As the log passes through the ring, three high-pressure jets delivering water at 1,400 lb. psi remove the bark. The unit replaces older mechanical equipment and supplements existing hydraulic debarking capacity.

The woodmill addition will also include a whole-log chipper that reduces a 36-in. diameter, 24-ft. log into uniform chips of the desired size in 14 seconds.

Suppliers of machinery and equipment for the Port Angeles project include: *Chipper*—D. J. Murray Mfg. Co.; *motors* (except barker pumps and chipper motor)—Allis-Chalmers Mfg. Co.; *barker pump motor, chipper motor, substation, control desks and cubicles*—Westinghouse Electric Corp.; *transfers, roll cases, belt and refuse conveyors*—Sumner Iron Works; *bundle deck and chipper bridge cranes*—Berger Engineering Co.; *chip silo*—Beall Pipe & Tank Corp.; *rotary plate feeder for chip silo*—James Brinkley Co.; *gear drives*—Western Gear Works; *air compressor*—Ingersoll-Rand Co.; *barker*—Hansel Engineering Co., and *barker pump*—Byron Jackson Co.

In New York, N. Y., James T. Sheehy, executive vice president, commented that this latest investment in woodmill facilities is part of Rayonier's conservation program calling for constant improvement in wood handling facilities to "obtain maximum economic use from both public and private forests." He added that the Port Angeles addition is another step toward obtaining more chemical cellulose from any given quality of timber.

•

$575,000 Building Program Under Way at Flambeau Paper

An improvement program that will cost approximately $575,000 is under way at the Park Falls, Wis. mill of the Flambeau Paper Div. of Kansas City Star Co.

Approximately 24,000 sq. ft. of floor space is being added to the finishing department by the construction of a two-story steel, brick and concrete building measuring 100 by 140 ft. The addition is to be directly connected to the present finishing department.

With the installation of a new 84-in. Harris-Seybold guillotine trimmer, the plant will boast three 84-in. units, one of 72 in., and one of 54 in.

The Black-Clawson Co. has been awarded a contract to furnish various new pieces of equipment for the paper machines. A drum-type reel and winder of the most modern design is to be installed on both machines. Additionally, No. 1 machine will be equipped with a size press and after dryers, also being furnished by Black-Clawson. (The winders, while being supplied by Black-Clawson, are products of Cameron Machine Co.)

•

Southland Plans Third Machine

A third paper machine will be added to the production line at Southland Paper Mills Inc. in Lufkin, Texas. E. L. Kurth, president, declares that this will bring the total annual capacity to an excess of 200,000 tons of newsprint.

Work was to begin immediately on the 77,000-ton machine; auxiliary equipment has already been ordered. Actual production is expected in the latter part of 1956.

Southland produced its first newsprint from east Texas slash pine in 1940. Six years later a second machine was added, boosting the total capacity to 135,000 tons.

•

St. Helens Expansion

Early steps in a long-range expansion program have been completed at St. Helens Pulp & Paper Co. in St. Helens, Ore. Included in the project is the rebuilding of No. 1 machine, additional digester facilities, expanded chip storage, a new lime kiln and finishing room.

As reported earlier, Crown Zellerbach Corp. plans the installation of a new tissue machine at its St. Helens operation. The 258-in. Yankee now being built by Beloit Iron Works will have an annual capacity of 35,000 tons.

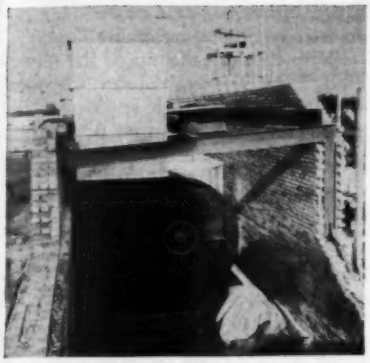
According to J. D. Zellerbach, approximately $7,000,000 is being spent on the over-all program. During March and April the property between the mill and the mill dock was leveled. About 110,000 yds. of fill were required. Chip silos, conveyors and necessary conveyor buildings will be built on the filled land.

•

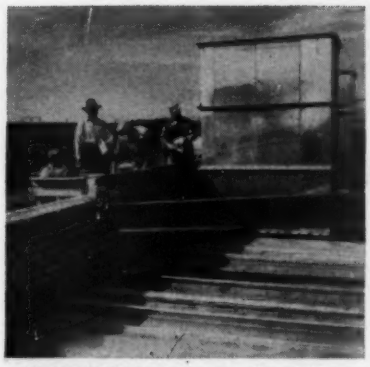
Publishers' $500,000 Program

Early in April the new bleach plant at Publishers' Paper Co. was undergoing trial runs. The new water filtering system at the Oregon City, Ore. mill was being readied for June operation. The cost of the improvements has been more than $500,000.

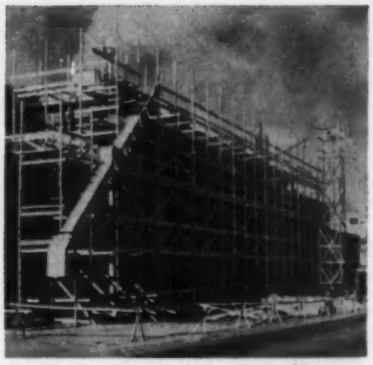
The 250-ton bleach plant will handle all groundwood; the bleached pulp will be used to produce whiter,



ONE OF FIVE exhaust fans installed at Kenora by Mando



LAYING BRICK prior to raising the machine room roof



NORTH WALL of Kenora machine room during installation of heat recovery system

Mando Installs New Heat Recovery System at Kenora

The installation of a new heat recovery system has recently been completed at the Kenora, Ont. newsprint mill of Minnesota & Ontario Paper Co. The improved operation of No. 9 paper machine and better working conditions resulted from the project.

The unit recovers heat from discharged vapors, which in turn is used to heat process and shower water from 50°F. to 90°F. Heated vapor from the paper machine is also utilized in warming incoming air that is distributed to the machine room floor and basement. Equipment is of the latest design, complete with water heating facilities and automatic controls.

Fans, duct work and automatic controls for the system were supplied by Ross Engineering of Canada Ltd. Mando crews installed the unit. The firm also supplied motors, starters, etc.

The project required the removal of a section of the machine room roof 14 ft. wide and 150 ft. long. This portion of the roof was raised 3 ft. 9 in. Within the raised portion five exhaust fans and five fresh air supply fans are connected to five economizer units. Each fan has a capacity of 40,000 cu. ft. of air per minute.

---

brighter newsprint and also in the production of specialty products.

More than 15,000,000 gal. of water daily will be provided by the filtering plant. Water will be pumped from the Willamette River when gravity flow fails to supply a full head, and will be stored underground.

•

Hammermill Starts Multi-Million Dollar Project

Work started recently on a $5,000,000 expansion program at the Erie, Pa. mill of Hammermill Paper Co. Rust Engineering Co. of Pittsburgh are the design-engineers and in charge of letting sub-contracts.

Two buildings are being constructed to house the new bleaching and pulping process known as the "neutra-cell" process, according to Donald S. Leslie, president of Hammermill. The method, developed by the firm's chemists and engineers, will allow use of Pennsylvania woods.

•

Machine Rebuild to Key International Project

The rebuilding of No. 3 paper machine and its conversion to the production of machine coated paper will be the center of a major expansion at International Paper Co.'s Hudson River mill in Palmer, N. Y. O. B. Beyer, mill manager, has announced that budget approval for the project has been secured.

The machine will operate at a speed exceeding any previously reached at the plant. One of the features will be a removable fourdrinier, the first at the mill.

Related improvements will include: expansion of the color preparation plant; replacement of one of the seven supercalenders with a 147-in. unit, and the revamping of the sulfite system (a hot-cold system is being installed along with an accumulator and a caustic bleaching stage).

•

Waste-Using Mill of Oregon Fibre in Operation

The $6,000,000 fiberboard operation of Oregon Fibre Products Inc. at Pilot Rock, Ore., is in production. At full capacity, the plant will produce a daily 300,000 board feet of hardboard, structural insulation board, decorative board and acoustical tile. U. S. Gypsum Co. has contracted to take the entire output.

Some 60 per cent of the basic raw material is to be in the form of bark-free chips made from slabs, edgings and factory waste. Suppliers will include Oregon Fibre's associated industries, Pilot Rock Lumber Co. and Kerns Co. of Oregon Ltd. Additional chips will be purchased from neighboring sawmills.

Chips are processed through Bauer rapid cycle digesters and attrition mills, where they are reduced to fine, strong wood fibers. After washing to remove dissolved organic material, the wood pulp is formed into a continuous sheet on a Downingtown fourdrinier forming machine. Following the drying operation in a Coe dryer, the board

35th Annual Convention

American Pulp & Paper Mill Superintendents Association

will be held June 21-23
at the Sheraton-Mount Royal Hotel in Montreal

Up for discussion: Management and Labor Look Ahead to constantly improving equipment, methods and processes, compulsory retirement and odor elimination

Among the outstanding speakers: A. E. Harold Fair, president of Alliance Paper Mills Ltd.; John P. Burke, president of the International Brotherhood of Pulp, Sulphite and Paper Mill Workers; W. P. Nesbitt of Howard Smith Paper Mills Ltd., and Dr. W. J. Nolan, professor of chemical engineering research at the University of Florida

NEW GRINDER ROOM at Minnesota & Ontario Paper Co.'s newsprint and groundwood specialty mill in Fort Frances, Ont.; the $5,000,000 project boasts 13 Waterous super hydraulic magazine grinders that use 4-ft. wood; their capacity is a daily 455 tons of pulp

is cut to size and pressed in a 6400-ton hydraulic press.

The plant was designed by the firm's chief engineer, C. C. Stewart, with the assistance of Johnson & Johnson, Chicago engineers. General contractor was L. H. Hoffman Co. of Portland.

Key personnel of Oregon Fibre are: E. C. Kerns, president; A. W. Moltke, vice president and treasurer; L. W. Stockman, vice president; Calvin Souther, secretary, and O. B. Eustis, general manager.

C. H. Shepherd Jr., board mill superintendent; Don Barnes, finishing superintendent; Carl Shaw, hardboard department superintendent; J. C. Livingston, fabricating superintendent; R. M. Granum, research director, and Don Woods, controller.

•

Bowater's Newfoundland Project

Current expansion and modernization at the Corner Brook, Nfld. mill of Bowater's Newfoundland Pulp & Paper Mills Ltd. is nearing completion. According to Sir Eric Bowater, chairman of the board, operation is expected late this year.

Included in equipment now being installed is a high-pressure boiler, a 6,000-kw turbo-generator, and an addition sulfite digester.

•

Hinde & Dauch Mill to Close

Officials of Hinde & Dauch Paper Co. have announced that Mill No. 2 in Sandusky, Ohio, will be closed June 30. Some 135 persons will be laid off.

The plant was built in 1910 and produced straw paperboard for corrugating. Spokesmen for the firm reported that the product is no longer competitive, and that the mill will be offered for sale since no further operation is contemplated.

•

Name Change Announced by Pacific Mills Ltd.

Crown Zellerbach Canada Ltd. is the new corporate name of Pacific Mills Ltd. The action was to be effective April 16. The change in name involves no change in company officers, according to Paul E. Cooper, president of Pacific Mills.

F. N. Youngman

Frank N. Youngman was recently elected a director and chairman of the board of Pacific Mills, following his resignation as a director and vice president of the parent company, Crown Zellerbach Corp., and as a director and president of St. Helens Pulp & Paper Co. At the same time, Mr. Youngman was made a director and board chairman of Canadian Western Lumber Co. and Elk Falls Co. Ltd.

A veteran in the industry, he was at one time associated with Consolidated Water Power & Paper Co., joining Pacific Mills as vice president and director in 1927. In 1938 he was made C-Z vice president and in 1947 was elected a director.

Mr. Cooper, who was recently named president of Elk Falls, has been with Pacific Mills 11 years and its president since 1944. He is an engineer with 30 years' experience in the industry.

Ohio Newspaper Cooperates In Hardwood Newsprint Tests

With the sponsorship of the Cleveland *Plain Dealer,* Kinsley Chemical Co. of Cleveland has announced the production of a newsprint paper composed of pulp containing 40 per cent poplar. (See THE PAPER INDUSTRY for January 1954, page 1104.)

Edward R. Timlowski, vice president and technical director of Kinsley, has declared that previous experiments were unsuccessful when more than 20 per cent hardwood was used. Hardwoods such as poplar, gumwood and cottonwood are so plentiful, he added, that they are regarded as "waste," while softwood currently being used in newsprint is being consumed faster than it can be grown.

Mr. Timlowski said that more than 1,000 tons of the new paper were turned out in the experiment at the Hennepin Paper Co. mill at Little Falls, Minn. Kinsley hopes to manufacture the paper at slightly less than the present $126 a ton Canadian price.

•

Paper Executives See Distribution and Promotion as 1954's Big Problems

Two prominent executives in the pulp and paper industry have cited the problems of distribution and promotion as major hurdles to be overcome in 1954.

Speaking at a meeting of the Sales Executive Club of Northern New Jersey, Thomas B. McCabe, president of Scott Paper Co., said that the American economy is on the verge of a desperately needed era of scientific distribution.

"It has become obvious—almost to the point of embarrassment," he said, "that our economy rests on three legs, not just two. The third leg—distribution— has not had the benefit of the scientific study that has contributed so much to the other two segments—research and production.

"Distribution lags behind the other two segments because until only recently distribution techniques were well enough formulated and charted to move all the goods and services our energetic economy could produce. . . .However, distribution must now be surveyed with the same intense, penetrating scientific study to which research and production have been subjected.

". . .The principal objectives of fundamental distribution research would be the reduction of marketing costs with consequent lowering of prices and the widening of markets. Sales, production, employment and earnings would be given

The Chicago Bridge & Iron Company is pleased to announce that the well known line of

CONKEY EVAPORATORS

now extensively used in pulp and paper mills, will in the future be fabricated in CB&I's plants.

A sales and engineering office, staffed by Conkey Equipment personnel will be maintained at 165 Broadway, New York 6, N. Y.

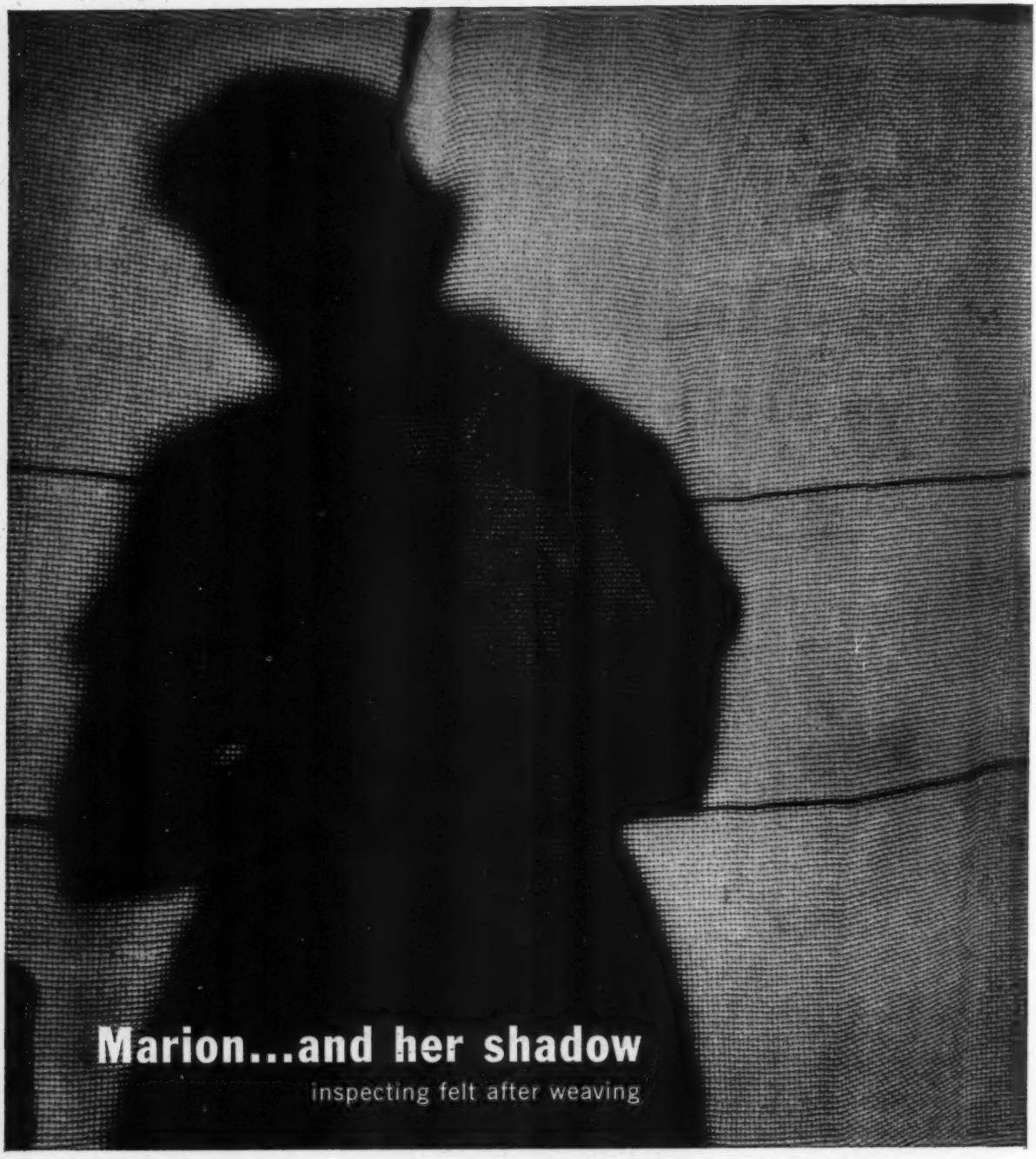
Since both Chicago Bridge & Iron Company and the Conkey personnel have been closely associated with the pulp and paper industry for many years, the combination is ideal to insure proper design, fabrication and erection of CONKEY EQUIPMENT.

CHICAGO BRIDGE & IRON COMPANY

BIRMINGHAM, CHICAGO, SALT LAKE CITY and GREENVILLE, PA.

CONKEY EQUIPMENT

Atlanta, 3	2143 Healey Building
Birmingham, 1	1511 North 50th Street
Boston, 10	1026—201 Devonshire Street
Chicago, 4	2445 McCormick Building
Cleveland, 15	2267 Midland Building
Detroit, 26	1566 Lafayette Building
Havana	402 Abreu Building
Houston, 2	2143 C & I Life Building
Los Angeles, 17	1559 General Petroleum Building
New York, 6	3350—165 Broadway Building
Philadelphia, 3	1653—1700 Walnut Street Building
Pittsburgh, 19	3251 Alcoa Building
Salt Lake City, 4	527 West 17th South Street
San Francisco, 4	1547—200 Bush Street
Seattle, 1	1327 Henry Building
Tulsa, 3	1651 Hunt Building



Huyck can weave any felt to meet your needs—any size or construction, for any requirement. Here are the reasons why:

- Huyck mills are equipped with the finest machinery available
- Huyck's weaving experts are trained in every advanced technique
- Huyck's field engineering department is the largest, and the best trained, in the felt industry
- Huyck's research and development department works constantly to improve weaving processes.

This is the most effective team in the felt industry, and it is always *at your service.*

Consider service carefully when you buy felts: it must be always complete and dependable. As the Huyck service record proves, Huyck felts—with Huyck service—mean better production and lower costs for you.

KENWOOD TEXTILE PRODUCTS

HUYCK FELTS

first in quality...first in service

F. C. HUYCK & SONS • ESTABLISHED 1870 • RENSSELAER, NEW YORK

greater stability through better knowledge of how to stimulate consumption. The new products on which our economy depends could be more effectively introduced at lower costs."

Tremendous purchasing power

Business in 1954 faces a "fighters' market," according to Kenneth W. Henderson, advertising manager of Eastern Corp. Mr. Henderson spoke at the annual meeting of Eastern executives and paper merchants.

The speaker declared that all signs point to tremendous purchasing power on tap in the country. But nobody, he added, is throwing his money away.

"It's not a sellers' market," Mr. Henderson continued, "because there's no shortage of goods. It's not truly a buyers' market either, because there's plenty of demand. The demand is there, but it's restrained; buyers take their time before they purchase. They're looking for bargains."

Sales gains in 1954 will go to the men and companies who fight for sales, he said, those who offer the consumers the most for their carefully-spent dollars.

In short, for the first time in a long while it's a healthy, competitive economy that will be good for the entire country.

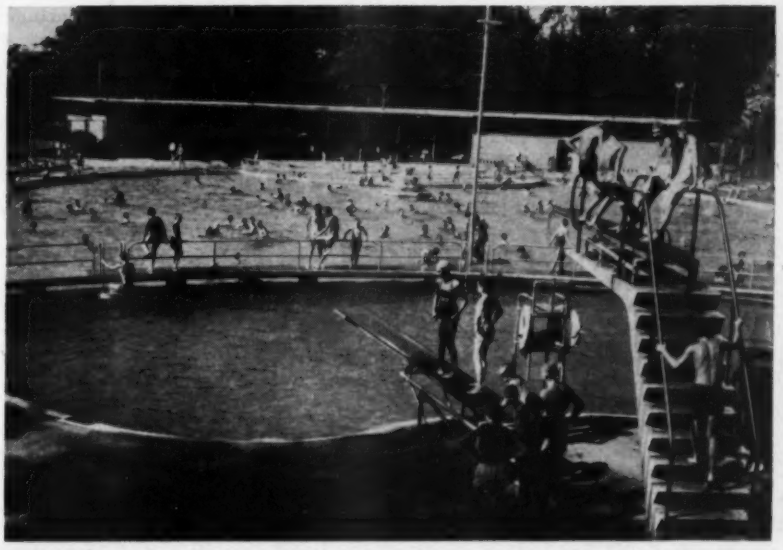
•

Conspiracy Battle Opens

Ten of Canada's largest coarse paper companies have opened a battle to have charges brought against them under the Federal Combines Act thrown out under the statute of limitations.

G. K. Guild, counsel for Pacific Mills Ltd., one of the firms charged with conspiring to eliminate fair competition, argued during the third day of the preliminary hearing that the charges are illegal. He contended that the firms are accused of conspiring to fix competitive prices between 1934 and 1951. The statute of limitations, he said, says no action shall be brought to recover a penalty after two years.

Defense counsels also announced they would argue the admissability of 8,000 documents siezed by the Royal Canadian Mounted Police as evidence. In some cases, objection will be based on the legality of search warrants used in obtaining the documents.



COMMUNITY RELATIONS project of the Mead Corp. at its Chillicothe (Ohio) Div.; recently completed, the swimming pool is one of the most modern and best equipped in the Middle West

Progress in Community Relations Project Reported by APPA

SUBSTANTIAL PROGRESS has been made by pulp and paper firms cooperating in the community relations program of the American Paper & Pulp Association. Companies throughout the country have established their individual programs to work as a part of the over-all goal: "To prove to the general public that the industry intends to be a good corporate citizen and neighbor."

The APPA-sponsored project was undertaken in 1948 and has grown in popularity and participation each year. According to D. J. Thomson of the Champion Paper & Fibre Co., the three cornerstones of good community relations are as follows: (1) good employee relations, (2) the complete cooperation of the executive group, and (3) good "corporate citizenship" on the part of the firm.

Eleven regional community relations committees have been formed under APPA auspices to organize and plan individual activities. The chairmen of these committees and the states over which they have charge are as follows:

D. G. Driscoll of Sorg Paper Co., Middletown, Ohio (Ohio); Eugene H. Clapp of Penobscot Chemical Fibre Co., Boston (Maine, New Hampshire, Vermont); H. D. Johnston of Strathmore Paper Co., West Springfield, Mass. (Connecticut, Massachusetts, Rhode Island); T. Stewart Foster of Foster Paper Co. Inc., Utica, N. Y. (New York); W. W. Race of Sutherland Paper Co., Kalamazoo, Mich. (lower Michigan); J. Bruce Morford of the Champion Paper & Fibre Co., Canton, N. C. (Alabama, Florida, Georgia, North Carolina, South Carolina, Tennessee, Virginia).

Frank Heyward of Gaylord Container Corp., Bogalusa, La. (Arkansas, Louisiana, Mississippi, Texas, Oklahoma); F. Huston McIlvain of Downingtown Paper Co., Downingtown, Pa. (Delaware, Maryland, New Jersey, Pennsylvania, West Virginia); John T. McCune of the Wisconsin Paper Industry, Menasha, Wis. (Wisconsin); John V. Hoene of the Forest Industries Information Committee, Duluth (Minnesota), and Walter Delong of Weyerhaeuser Timber Co., Tacoma (California, Oregon, Washington).

Highlights of progress

Periodic reports are submitted by the various participating firms relative to their activities. The APPA has published No. 1-Vol. 1 of *Community Relations Progress*. Progress attained in recent months is reported.

Hammermill Paper Co. of Erie, Pa., presented an endeavor in community relations with two half-hour television programs on successive Sundays in January. The purpose of "The Hammermill Story" was to acquaint the plant community with the history and background of the firm, its people, products, services and contributions to the community.

An issue of the house organ of **Brown Co.** in Berlin, N. H., has

been dedicated to the local police force to pay tribute to the protective arm of the law in the community.

Fitchburg Paper Co. of Fitchburg, Mass., has presented a 2000-volume "Bookmobile" to the city. This modernized public library has circulated more than 300 books during a single two-hour stop.

The woodland operations of **Kimberly-Clark Corp.** at Kapuskasing, Ont., has sponsored a crippled children's clinic through the cooperation of the Kapuskasing Kinsmen Club. Some 69 Ontario youngsters have been treated during the past year.

Nicolet Paper Corp. of West de-Pere, Wis.—a small two-machine mill—began the sponsorship of a Boy Scout troop more than two years ago.

The Champion Paper & Fibre Co. has produced three color films, "Good Business," "Deep Roots" and "Paper Work," which are now available through the firm's Industrial and Community Relations departments.

A 36-page booklet entitled "Forestry and Paper" has recently been published by **P. H. Glatfelter Co.** of Spring Grove, Pa. Combatting the threat of timber depletion and forest famine, the publication describes how wood has taken its rightful place beside steel, coal and other materials as one of the country's basic raw materials.

Nekoosa-Edwards Paper Co. of Port Edwards, Wis., has made available an attractive tour book, "The Story of Paper," which describes the firm's operations from the forest to the finished product.

•

Technical Conference to be Held at Forest Products Lab

The annual technical conference sponsored jointly by the APPA Committee on Coordination of Research and the U. S. Forest Products Laboratory will be held May 18 at the laboratory at Madison, Wis.

The open meeting program will be an all-day affair beginning at 9:30 a. m. and will be confined to reviews of research underway at the laboratory. Representatives of the pulp, paper and paperboard industry are invited.

The tentative program is as follows: "Structure of Pulpwood Barks," B. F. Kukachka; "Possibilities for Improving Per Acre and Per Cord Pulp Yields by Applying Genetic Principles and Known Management Practices," H. L. Mitchell; "Pulpwood Storage Problems," R. M. Lindgren; "Passage of Water Through Cellophane," A. J. Stamm; "Technic for the Study of the Mechanical Properties of Adhesive Bonds," C. B. Norris; "Purified Pulps from Sweetgum," F. A. Simmonds; "Technics for the Determination of Pulp Constituents by Quantitative Paper Chromatography," W. E. Moore.

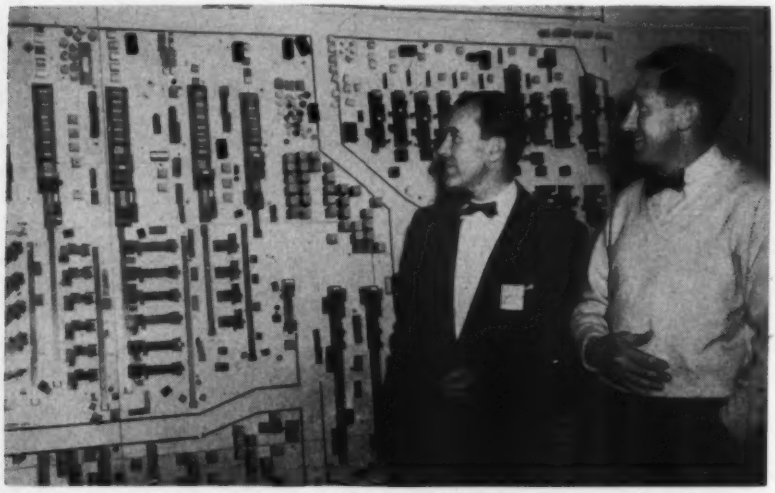
Following luncheon, there will be station visits for the purpose of discussion of various aspects of current work on: (1) Containers and packaging— fiber boxes, overlaid veneers, and cushioning materials; (2) veneer and plywoods; (3) testing fire resistance of wood and rigid fiberboards; (4) mechanical testing and development of design criteria of wood and fiber materials; (5) paper overlays for plywood, lumber, and veneer; (6) high-pressure hydrogenation of lignin, and (7) high-yield pulping processes and other studies in pulp and paper.

•

Crown Zellerbach Answers FTC Complaint on Monopoly

Crown Zellerbach Corp. is contesting a complaint of the Federal Trade Commission that C-Z's acquisition of St. Helens Pulp & Paper Co. of St. Helens, Ore., tends to lessen competition or create a monopoly.

The Crown Zellerbach reply is to the effect that its acquisition of St. Helens will make the latter firm a valuable factor in the growth of the Pacific Coast paper industry—instead of a company with a doubtful future. The FTC contends that C-Z and St.



SCALE MODEL FACTORY layout used by Union Bag engineers in plant design work; studying one section of the huge model are S. K. Bradley, vice president in charge of multiwall sales, and V. E. "Tex" Kelly, manager of the bag division

Scale Model Helps Union Bag Planning Engineers

The entire layout of Union Bag & Paper Corp.'s bag plant at Savannah, Ga., has been reduced in scale to occupy a space the size of one wall of an average room. The board on which the miniature machines rest is lined off to represent the floors of the various departments and can be supported in racks at an almost vertical position.

The models are held in place by tiny magnets that are attracted to the steel face of the floor panel.

Union Bag's industrial engineers —with the help of many other employees—made exact scale models of the standard, specialty, and multiwall bag departments, as well as the roll storage well. Not only has every machine and every printing press been represented on the model, but even fork trucks, waste trucks, rolls of paper and finished pallets of bags, all worked out to an exact quarter-inch scale.

Problems of efficiency

The layout of the world's largest bag factory is proving extremely useful in solving problems of efficient placement of machinery and equipment. Determining the location of such machinery and equipment is one of the costly problems of plant operation.

There are more than a thousand separate models of all kinds in the layout. E. A. Webb, carpenter in the bag factory maintenance department, made them all from drawings submitted by the engineering staff.

NOW Commercial 65% Yield News Sulphite is Here!

. . . made possible by CURLATORS

in continuous MILL OPERATION

CURLATOR

The Curlator is the first and only machine to produce a first-class news sulphite pulp at 65 per cent yield in full scale commercial operation.

This "semi-sulphite" replaces normal low yield sulphite pulp pound for pound in the newsprint furnish.

65% YIELD OF NO. 1 SULPHITE FOR NEWSPRINT

UP TO 30% SAVING IN WOOD ALONE *PLUS* UP TO 30% SAVING IN SULPHUR, LIMESTONE AND STEAM

43% INCREASE IN DIGESTER CAPACITY

WRITE for News Bulletin on Commercial 65% yield News Sulphite.

CURLATOR† Corporation
EAST ROCHESTER, NEW YORK

†T.M. Reg.—Curlator Corporation, Rochester, N. Y.

NEW PRODUCTS NEW STANDARDS

PENFORD GUMS

(STARCH HYDROXY ETHYL ETHERS)

(U. S. Patent Numbers 2,516,632; 2,516,633; 2,516,634)

PENFORD GUMS are the products of an exclusive patented process which makes it possible to attach hydroxy ethyl groups to starch molecules by strong ether linkages resulting in entirely new products — hydroxy ethyl ether starches. These perfected synthesized starch derivatives have the desirable characteristics of both water soluble film forming polymers and starch.

The unusual and highly advantageous properties contained in PENFORD GUMS are providing a solution of many quality and production problems.

PENFORD GUMS have established new standards of perfection in these operations:

1. CALENDER USAGE — PENFORD GUM 280 definitely increases Mullen on all board furnishes. PENFORD GUMS 240, 250, and 260 are widely used for finishing board later printed with most exacting high gloss inks.

2. TUB OR SIZE PRESS — Various grades of PENFORD GUM are used for improving strength, finish, controlling densometer, and for preventing excessive penetration of other finishing materials like lacquer, wax, ink, coatings, etc.

3. PIGMENTED SIZE PRESS COATING— PENFORD GUM 250 is used as the sole adhesive for producing coated offset paper and for coated board which may be wet finished on the calenders.

4. ON- AND OFF- MACHINE COATINGS — The high fluidity PENFORD GUMS, either as-is or resinated, are excellent coating adhesives assuring level coatings of high pick.

5. WET END ADDITION — PENFORD GUM 300 is a brand new member of the hydroxy ethyl ether class which is low temperature swelling and disperses without lumping in the fiber furnish but yet is completely gelatinized on the fastest machine. It requires no cooking and may be added dry or in liquid slurry.

6. ADHESIVES — A number of the PENFORD GUMS are used in adhesive formulations such as regular or waterproof solid fiber, corrugated board, bags, multiwall sacks, tubes, and drums. A special formulation has been developed for high speed layflat flexible adhesive.

PENICK & FORD, LTD.,

Incorporated

420 Lexington Ave., N. Y. 17, N. Y.

806 Bona Allen Bldg., Atlanta, Ga. Cedar Rapids, Iowa

Helens together provide about 85 per cent of the Pacific Coast output of Kraft paper.

•

Industry Expansion Notes

Weyerhaeuser Timber Co. has started construction on the paperboard machine building at the Longview (Wash.) Pulp Div. The new machine will turn out a daily 200 tons of corrugated paper. Completion is expected in May of 1955. . . . Operation is expected late this month at the newsprint mill of **Bowaters Southern Paper Corp.** in Calhoun, Tenn. Originally scheduled to begin production in April, the mill experienced delays in completing electrical connections . . . . **The Gardner Board & Carton Co.** has announced the formation of a subsidiary for the purchase of Letellier-Phillips Inc., Dayton, Ohio supplier of graded waste paper. Its capacity is an annual 35,000 tons of paper stock . . . **Container Corp. of America** has acquired 33 acres in Santa Clara, Cal., for the expansion of production facilities in the San Francisco Bay area. An 85,000-sq. ft. folding carton plant will be built.

The 16,000-sq. ft. addition to the Flint, Mich. plant of **Ottawa River Paper Co.** has been completed. It is expected that the production capacity will be increased 20 per cent through more efficient flow of materials . . . . A firm known as **Fibre Process Corp.** has been established at Carthage, N. Y., to reclaim waste paper and pulp fiber products for repulping and reuse.

St. Regis Paper Co. in recent months has been expanding its production of bleached and unbleached crepe grades at its kraft mill at Carthage, N. Y. . . . **Lathrop Vandewater Paper Co. Inc.** of New York, N. Y., has purchased John Floyd Paper Co. of Washington, D. C. The latter firm operates a 16,000-sq. ft. warehouse in the nation's capital.

Container Corp. of America has granted the building contract for its new corrugated plant at Fernandina Beach, Fla., to S. S. Jacobs Co. of Jacksonville. The building will be adjacent to the present kraft containerboard mill and will comprise 135,000 sq. ft. of floor space. Equipment will include a new high-speed corrugating machine that combines a sheet of board 96 in. in width, printing presses and other finishing equipment. . . . **National Vulcanized Fibre Co.** of Wilmington, Del., has acquired Marshall Bros. Inc. of Yorklyn as a wholly owned subsidiary. Since 1945 National has been using the Marshall mill's entire output.

Construction of the $2,000,000 plastic laminating plant of **Consoweld Inc.** at Wisconsin Rapids, Wis., is proceeding according to schedule. Installation of equipment is expected within one or two months. Consoweld was organized last August by Consolidated Water Power & Paper Co. and Arborite Co. of Canada and will manufacture high-pressure decorative melamine plastics for vertical and horizontal surfacing.

•

Greater Use of Waste Paper Urged

Even greater use of waste paper as a substitute for wood pulp is essential to our long-range national security. This view was expressed recently by Stuart B. Sutphin Jr., past president of the Waste Paper Institute.

Speaking in Cincinnati at a meeting of the Graphic Arts Trade Association Executives, Mr. Sutphin disclosed that last year 8,000,000 tons of waste paper "found its way to the mills as a direct or indirect substitute for wood pulp.

"As more waste paper is used, we

News of the Industry . .

'stockpile' more millions of acres of timberland for future growth and times of national emergency.

"Actually," he continued, "the waste paper industry is America's invisible forest." Mr. Sutphin emphasized that the waste paper dealers are a part of an "endless transmission belt" between the generators of waste paper and the paper and paperboard mills. If it were not for the waste paper industry, there would not be enough paper to go around, and paper prices would be astronomical.

"The (waste paper) industry acts as a flood control reservoir. You, the printers, turn out waste paper every hour of the day. It is our job to take the steady stream of waste paper before it backs up and floods you. Similarly, paper mills are dependent upon us to keep a steady stream of waste paper flowing into them, without floods, without drought."

New Brunswick Spraying No Longer Experimental; Target: 1,000,000 Acres

THE BATTLE AGAINST the spruce budworm in northern New Brunswick's valuable softwood stands is still in full tilt, and another 1,000,000 acres will be sprayed in June. Three of the forest airfields used in the 1953 program and two new ones will be utilized in the vast project. Already, 95 per cent of the DDT spray, gasoline, and other necessary materials has been stockpiled in the spraying area.

The attack is veering in a southeasterly direction, according to forest scientists, and is now heading toward the Miramichi watershed. It is in this area that the 1954 operations will be concentrated.

Speaking recently at the annual meeting of Forest Protection Ltd. in Montreal, Vernon E. Johnson declared that aerial spraying of forests to protect them against insect attack has progressed out of the experimental stage and has shown itself economically practical. Mr. Johnson, who is president of Forest Protection, added however that the long-range effects still have to be definitely proven.

"Achievements of the last two years in the New Brunswick 'battle of the budworm' are of tremendous importance to the Canadian forest," he declared. "We now consider it economically feasible to keep 5,000 to 6,000 square miles of valuable and productive forests alive for as long as we have to, in order to save them from destruction by an insect epidemic."

(Forest Protection Ltd. is a cooperative firm set up by the Province of New Brunswick and four New Brunswick pulp and paper companies to combat the budworm epidemic. Financial assistance is also being supplied by the federal government.)

Reduced per acre cost

New techniques gained from the 1952 and 1953 spraying campaigns have greatly reduced the cost per acre but at the same time have maintained the efficiency of the spraying. Estimates have placed the 1952 cost at $3.20 per acre; last year it was reduced to $1.40, and this year a light application is expected to cost about 70 cents.

Reporting on the specific results of the 1953 operation, Mr. Johnson said that they had been satisfactory from the point of view of both the entomologist and the forester. A very high proportion of the insects were killed, and the balsam fir and spruce in the spray area show visible improvement, having retained much of their new foliage.

News of the Industry . .

Some 40 spray planes supplied by Wheeler Airlines Ltd. of St. Jovite, Que., will be used this year. The companies participating with the provincial government are Bathurst Power & Paper Co. Ltd., Irving Pulp & Paper Ltd., Fraser Companies Ltd., and New Brunswick International Paper Co.

Forestry News Notes

Private enterprise is the major factor in the "reforestation" of the United States. Forest tree planting in 1953 was a record 715,548 acres. Of this total, 77,612 acres were on federal lands; 63,791 on state and county lands, and 574,145 on private lands.

Kimberly-Clark Corp.'s subsidiary, William Bonifas Lumber Co., will plant approximately 1,000,000 trees this spring in its reforestation program in northern Wisconsin and upper Michigan. Most of the stock will be four-year-old seedlings of white pine, Norway spruce and red pine. . . .The **United States Forest Service** has disclosed that it will purchase no more land for national forests pending a complete review of the land acquisition policy of the federal government.

Successful tests of television for spotting forest fires as much as 50 miles away were reported recently in Waltham, Mass. The Louisiana Forestry Commission Board notified **Raytheon Mfg. Co.** that test pictures were so clear that observers could identify a cow munching grass four miles from the camera.

STAFF MEMBERS OF THE Wisconsin Sulphite Pulp Manufacturers Research League and of the Institute of Paper Chemistry at Appleton inspect the new evaporating and burning plant for sulfite liquor at Northern Paper Mills in Green Bay; the unit went into operation last fall at a cost of several million dollars and is the largest of its kind in the world; N. L. Malcove, Northern technical director, explains the operation to (l to r) Groff Collett, Dr. Lawrence Boggs, Helen Faas, Milton Leferve, Bernard Van Camp, A. J. Wiley, G. Dubey and Bernard Lueck

Constant Expansion of Research Key to Wisconsin Pollution Battle

WISCONSIN SULFITE PULP mills have paid out more than $10,000,000 on research and other work to abate sulfite pollution and will have to eventually spend an additional $15,000,000. This was the opinion expressed in the annual report of the Sulphite Pulp Manufacturers' Research League of Appleton.

According to J. M. Conway, president of the League and also of Charmin Paper Mills of Green Bay, "to clear Wisconsin streams of sulfite pollution will require the industry to make an investment of at least $25,000,000 when science learns how to complete the job—a substantial fraction of the total investment these 13 Wisconsin mills already have in plant and equipment." (The 13 member mills of the League.)

"Sulfite pollution is being reduced year after year as our scientific staff gives us more answers and as more of our mills succeed in applying these new techniques," Mr. Conway reported to the League membership. "During 1953, operation proved that we now have techniques capable of reducing undesirable stream conditions. It remains to be proved that these can be used without serious financial harm to the mills."

Major shift in research

A major shift in spent sulfite liquor research was forecast by Averill J. Wiley in his annual report to the League. Mr. Wiley is technical director of the organization.

"League researchers have perfected three big-tonnage whole-liquor techniques: evaporation-burning, roadbinder, and torula yeast. Several other whole-liquor researches are in process, and these may find some substantial uses.

"But the whole-liquor field appears to have been rather thoroughly worked over. The future seems likely to see more big-tonnage uses uncovered from the relatively unexplored liquor fractions.

"Some ingredients in spent sulfite liquor tend to cancel out each other's valuable characteristics. Spliting two of these fractions apart, for instance, might yield two excellent products for large markets.

"The League's research in recent months has shifted toward liquor fractions and away from whole liquor. This change of scientific direction should lead us more surely and more promptly to the big-tonnage uses which alone can solve the sulfite pollution problem for all time to come."

The League research program as of December 31, 1953, consisted of work in three major fields: (1) Whole Liquor Research—roadbinder, evaporation, burning, briquetting, soil filtration; (2) Sugar Fraction Research—torula yeast and other fermentation processes and basic investigation on sugars, and (3) Lignin Fraction Research—chemical derivatives and insolubilization.

Charmin project on schedule

Division of spent liquor from the Fox River and Green Bay came a step nearer recently as work was started on the structural steel for the new torula yeast plant of Charmin Paper Mills Inc. at Green Bay, Wis.

The plant is being built to process all the collected liquor from Charmin's sulfite pulping operations; it has been approved by the Wisconsin State Committee on Water Pollution as meeting that group's standards.

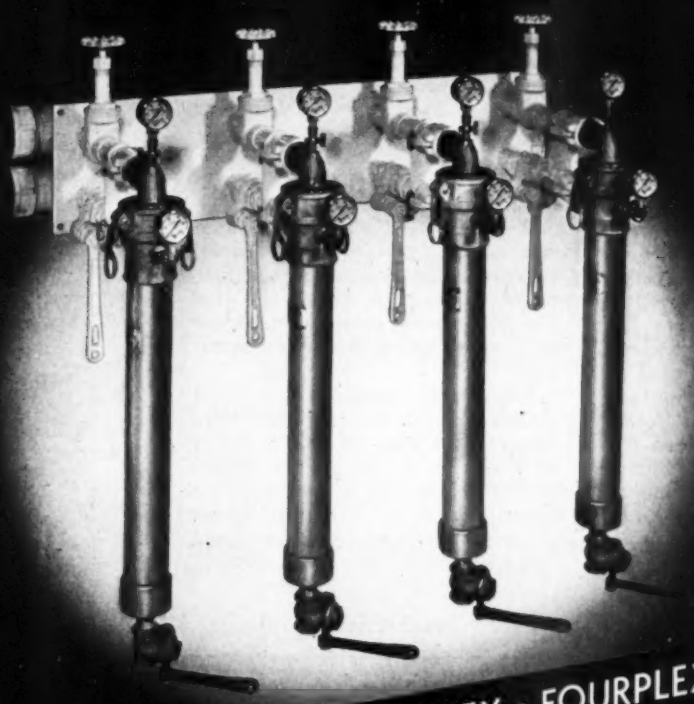
The foundation and substructure of the $2,500,000 yeast factory are in the final stages of completion. Some large pieces of equipment have already been set in place so that the

Quick Coupling
Non Short-Circuiting

RONNINGEN

FLUID FILTERS AND STRAINERS

FOR PAPER MILLS



SIMPLEX • DUPLEX • TRIPLEX • FOURPLEX

STRAIN AGAIN with RONNINGEN

FRESH WATER
WHITE WATER

"Particles large or small . . . We FILTER them all"

Write for new Ronningen FILTER BULLETIN No. 25406K

Ronningen-Petter Company
VICKSBURG, MICHIGAN — TELEPHONE 5161

News of the Industry . .

building will go up around them.

The plant is scheduled to begin yeast manufacture by the end of this year. It will be the largest torula yeast operation in the Western Hemisphere and will have an annual capacity of 30,000 pounds.

News notes on the pollution battle

Rhinelander Paper Co. of Rhinelander, Wis., has substantially increased the plant capacity of Lake States Yeast Corp., a subsidiary firm set up to make torula yeast from spent liquor. The latest capacity boost is the fourth since the plant was built in 1948.

The step-up resulted from adding a modern large-capacity dryer to Lake States' equipment, thus opening up a production bottle-neck. The new unit permits the plant to process 10 per cent more spent sulfite liquor from the pulp mill. The vitamin-rich torula yeast manufactured is used in animal and human nutrition.

Brown Co. at Berlin, N. H., has been operating a pilot plant to recover Furfural from its hardwood sulfite waste liquor. The experiment was undertaken in an effort to clean up the Androscoggin River at Lewiston. (Furfural is a synthetic chemical derived from the natural sugars in hardwoods.)

Brown's pilot plant has been conducting experiments to determine whether Furfural can be produced profitably. The present market for the synthetic is $230 a ton. Besides use in the manufacture of nylon, Furfural can be used in making resins, in purification of lubricating oils, and in other extraction processes.

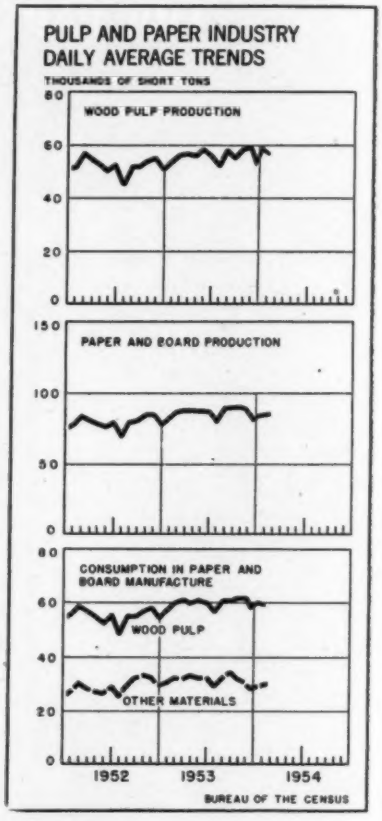
According to a report issued by Brown, "Apart from the profit that may be realized if this pilot plant operation is successful, the recovery of Furfural would bring a significant drop in stream pollution from this source." President Laurence F. Whittemore adds, "While this pilot operation may not be fully proved out as yet, results thus far indicate that the basic process proposal is sound, and that a recovery of 30 tons a day may be anticipated during hardwood operations."

Constantine Board & Paper Co. of Constantine, Mich., and **Rocky River Paper Mills Inc.** of Three Rivers have been honored for their efforts in cutting pollution of the St. Joseph River. Citations were made by the St. Joseph County Sportsman and Conservation Club.

SECOND GUMMED tape slitter and rewinder being installed by Hudson Pulp & Paper Corp. at Palatka, Fla.; built by Kidder Press Co. Inc., the slitter is designed for operation at speeds up to 2,000 fpm and in widths up to 94 in.

February Pulp, Paper and Board Production

Paper and board production during February amounted to 2,042,639 tons, according to a report released by the Bureau of the Census. This is a 2 per cent decrease from the 2,077,542 tons produced in February a year ago. Paper production, amounting to 920,211 tons, registered a 3 per cent increase from the 892,754 tons of February 1953. The output of paperboard grades during the month totaled 911,159 tons and reflected a decrease of 5 per cent from the 964,093 tons of a year ago.



Pulpwood receipts at the pulp mills during February amounted to 2,387,633 cords, with consumption at 2,191,027 cords. Month-end inventories at 5,834,697 cords reflected a corresponding increase of about 200,000 cords.

Wood pulp production during February amounted to 1,370,240 tons, as compared to 1,350,197 tons in February 1953.

Wood pulp inventories at the end of February at the paper and board mills amounted to 497,840 tons, showing a 1 per cent increase during the month.

U. S. Paper and Paperboard Production

	Feb. 1954 (tons)	Jan. 1954 (tons)	Feb. 1953 (tons)	Total 1953* (1,000 tons)	Total 1948
Paper and Board, total	2,042,639	2,163,592	2,077,542	26,566	21,397
Paper, total	920,211	978,990	892,754	11,387	11,119
Newsprint	87,236	95,149	80,989	1,065	876
Groundwood paper (uncoated)	63,110	67,910	61,828	782	772
Printing and converting (coated)	93,811	104,653	92,368	1,182	809
Book paper (uncoated)	127,073	133,499	128,043	1,630	1,570
Fine paper (writing, cover and text, bristols, thin paper and other)	102,297	103,041	99,778	1,280	1,141
Coarse paper (unbleached kraft, glassine, greaseproof, vegetable parchment and other)	278,203	297,093	268,638	3,422	3,027
Special industrial paper	30,383	33,279	32,504	411	308
Sanitary tissue stock	107,763	112,109	98,561	1,255	983
Tissue paper	19,750	22,312	18,916	233	205
Absorbent paper	10,585	9,945	11,129	128	107
Paperboard, total	911,159	984,549	964,093	12,307	9,366
Container board, total	469,284	527,772	511,888	6,740	5,079
Liners	314,941	364,092	342,938	4,541	3,347
Corrugating material	133,491	141,974	142,804	1,873	1,376
Container chipboard	20,852	21,706	26,046	326	319
Bending board	291,706	297,624	291,293	3,552	2,153
Non-bending board	72,028	73,367	73,872	936	597
Special paperboard stock	72,331	80,179	81,130	990	1,568
Cardboard	5,810	6,607	5,910	88	87
Wet machine board, total	11,355	11,691	12,609	155	142
Construction paper and board, total	199,914	188,362	208,086	2,718	2,591
Construction paper	94,077	87,243	95,876	1,317	1,321
Hardboard and insulating board	105,837	101,119	112,210	1,401	1,270

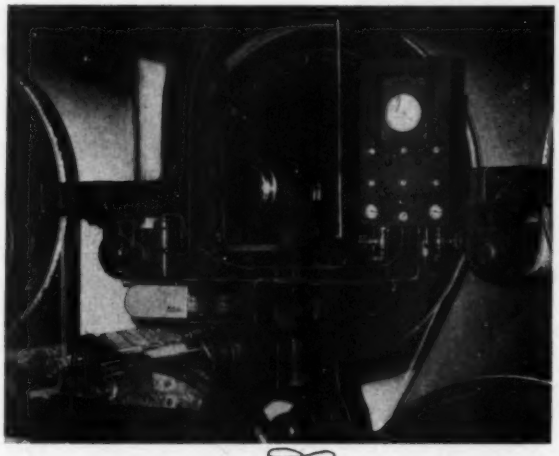
(*) Preliminary report. Source: U. S. Department of Commerce.

STICKLE NEWS

Stickle Equipment
Cuts the cost of steam

Published by Stickle Steam Specialties Co., 2215 Valley Ave., Indianapolis 18, Indiana

New Control Maintains Moisture Content Within ½ of 1%



Records and Indicates Moisture Variation of Sheet and Steam Pressure in Dryers

The new Stickle Pres-Ten-Trol automatically maintains the exact moisture content desired in any type of paper or paper board. ..It regulates steam flow to the dryers — to increase or decrease drying rate — in accordance with variations in moisture content of the sheet passing over the dryers, regardless of normal variations in machine speed or weight of the sheet.

Under actual operation in a 24-hour test on a 33-lb. 24 x 36 500-basis sheet, the unit held moisture content within 3/10 of 1%.

The system is described in free bulletin 360-C, now available from Stickle.

• • •

Drainage System is Guaranteed to Cut Paper Mill Steam Costs

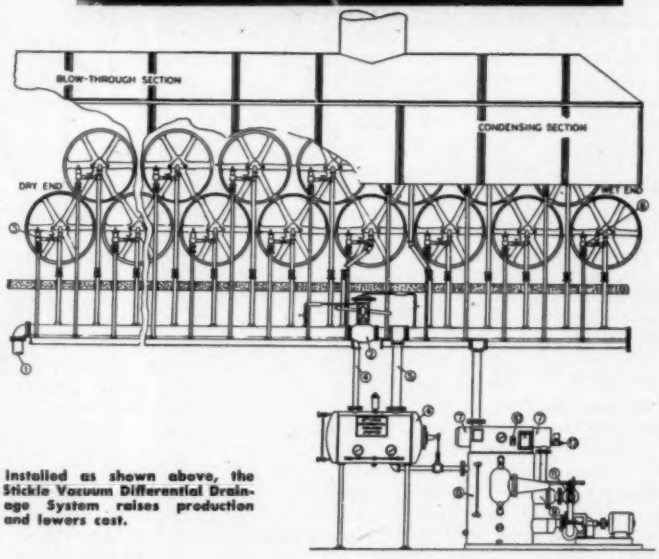
The Stickle Vacuum Differential Drainage System cuts fuel costs 10 to 15% by quickly freeing dryers of condensate and air, permitting them to operate at highest efficiency.

Besides saving steam, the system returns condensate to the boiler room at a higher temperature, thus reducing the cost of steam two ways. The system may be used on paper machines operating at medium and low pressures, and on vacuum.

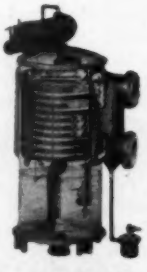
Included in the system are three of the units shown below — vacuum pump, automatic differential valve, and visible micro adjustable orifice.

Details on the system appear in free bulletin No. 260, available from Stickle on request.

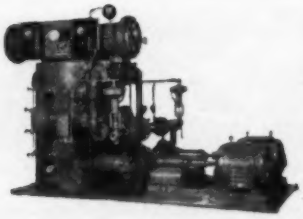
• • •



Installed as shown above, the Stickle Vacuum Differential Drainage System raises production and lowers cost.

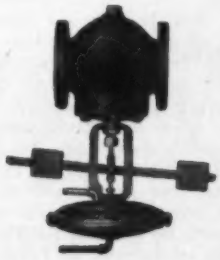


"X-Ray" view of the Stickle Open Coil Deaerating Feed Water Heater . . . guaranteed to heat more water to higher temperature in less space than any other heater at any price. Capacities: 3,000 to 300,000 pounds per hour.



The Stickle Vacuum Pump is main unit of the Vacuum Differential Drainage System. Single and duplex models. Capacities up to 300 GPM (water) and 290 CFM (air); or 900 GPM (water only).

Stickle Visible Micro Adjustable Orifice permits accurate modulated temperature control on dryers with visible operation. Eliminates steam losses due to excessive "blowing through" into return lines.



Stickle Automatic Differential Valve controls exact differentials in pressure between two sections of paper machine, assuring proper drainage at all pressures.

The Paper Industry Allied News

SALES REPRESENTATIVES of Diamond Iron Works of Minneapolis attend a conference at the Chicago headquarters of Goodman Mfg. Co.; Goodman recently acquired the Diamond line of hogs and chipmills for the paper, wood and meat packing industries; seated around the table (l to r): George McCorison of Diamond; Arthur Grasse, vice president, and William Goodman, president, of Goodman Mfg. Co.; and John Blackman, John Nagle and Floyd Jones, all of Diamond

Allied News Notes

Tri-Clover Machine Co. of Kenosha, Wis., is now a division of Ladish Co. of Cudahy. The acquisition was by means of purchase of Tri-Clover's capital stock. The Kenosha firm was a pioneer in the development of high alloy and stainless steel light-weight corrosion resistant pipe fittings, valves, pumps, and specialties. . . .Lockport Machine Co. of Lockport, N. Y., together with all rights to property, name, patterns and drawings, has been acquired by Simco Paper Machinery Corp. of Brooklyn. As a division of Simco, Lockport Machine will produce paper bag converting machinery, garment bag, liner, tuber, analine and oil ink multi-color printing presses, and special purpose slitting and rewinding machinery. Simco will move its entire plant to the Lockport address.

Albany Felt Co. of Albany, N. Y., has announced the following changes in sales territories: Lowell Brown, who has been servicing paper mills in California and the South, will no longer cover plants in Texas, Kansas and Oklahoma; in addition to California and Colorado, he will henceforth service Oregon mills, now handled by Harry Stilwell. Mr. Stilwell will concentrate his efforts in the state of Washington, as well as British Columbia and Alaska. Walter S. Rooney, sales engineer for AFC for 36 years, has retired, and the paper mills he covered in the deep South will be served by William H. Schaffner, who is also taking mills in Texas and Arkansas from Mr. Brown and other mills in the central South from Ray Dustrude, who was recently named assistant sales manager. Mr. Schaffner is giving up mills in Connecticut and New York, which he has serviced for 13 years. They will be covered by John Howell.

A $12,000,000 chemical plant with eight major buildings and a total floor space of 124,000 sq. ft. has been completed for Hooker Electrochemical Co. at Montague, Mich. Production will include chlorine, caustic soda, and hydrogen gas. . . .Swenson Evaporator Co. Div. of Whiting Corp. has announced the assignment of additional engineers to its district offices: Harvey K. Waters to Birmingham, Ala., and George Kleinman to Houston, Texas.

The Dilts Machine Works Div. of the Black-Clawson Co. has acquired the rights to the Pacemaker line of printing presses and associated equipment. Included in the line is the Pacemaker offset press, the Pacemaker two-drum winder, and the collapsible register reel. The equipment will be manufactured exclusively by Dilts at Fulton, N. Y. . . .Samuel M. Langston Co. of Camden, N. J., and Masson Scott Co. Ltd. of London, England, have enlarged the scope of their agreement so that it now covers the manufacture of all the machines that make up a complete corrugating unit.

The Seattle district office of Bailey Meter Co. has moved to larger quarters at 200 Broadway, Seattle 22. . . .Arnold, Hoffman & Co. of Providence, R. I., has announced the opening of a sales service laboratory in Teterboro, N. J. . . .The Cleveland office of Leeds & Northrup Co. has been moved to larger quarters at 1922 E. 107th St. . . .Chemical Linings Inc. will build a plant in Watertown, N. Y. . . .Jackson & Church Co. of Saginaw, Mich., has appointed Homad Services Ltd. of Montreal as manufacturers representative in central and eastern Canada.

Stowe-Woodward Inc. will build a branch plant in Neenah, Wis., to serve Midwestern papermakers. The firm has concluded lease agreements with J. W. Hewitt, Machine Co. providing manufacturing, laboratory and office space for rubber roll production. Installation of equipment was to begin in April, and production was to start early in May.

Worthington Corp. has announced the acquisition of the net assets, name and good will of L. J. Mueller Furnace Co. in exchange for Worthington common stock. Mueller is a leading manufacturer in the field of home heating. The Mueller plant will be operated as the Mueller Climatrol Div.

•

Allied Personalities

R. W. Hagemeyer has been named product manager of calcium carbonate sales in Wyandotte Chemicals Corp's Michigan Alkali Div. He will be responsible for directing the sale of Purecal to the paper, rubber, paint, plastics, printing ink, pharmaceutical and other industries . . . . W. J. Thomas, general manager of the Tubular Products Div. of the Babcock & Wilcox Co., has been made a vice president of the firm. . . . Emil Hladky, manager of the ultramarine blue plant at Newark, N. J., has been appointed manager of American Cyanamid Co.'s new titanium dioxide pigment plant now under construction near Savannah, Ga.

C. H. "Bert" Kent, veteran special sales representative for the Paper Makers Chemical Dept. of Hercules Powder Co., has retired after 41 years' association with the pulp and paper industry. He was one of the founders of the Connecticut Valley Div. of the Superintendents Association. . . .C. Westcott Gallup Jr., formerly a sales representative for R. T. Vanderbilt Co. Inc., has joined the felt sales staff of F. C. Huyck & Sons. He is contacting paper mills in the Midwest. . . .Arthur M. Grasse has been elected vice president in charge of industrial products for Goodman Mfg. Co. of Chicago. Mr. Grasse, who has been with Goodman for 33 years, will continue to be in charge of the Industrial Manufacturing Div., as well as the newly acquired Diamond Iron Works line of chipmills for the paper, wood and meat packing industries.

Nopco Chemical Co. has announced the election of Thomas A. Printon as board chairman as well as president. He has been with Nopco since 1922. . . . R. C. Angell has been appointed supervisor of Allspeed sales for the Oil City Works Mechanical Power Transmission Sales Div. of Worthington Corp. . . . American Car & Foundry Co. has announced the appointments of two new sales engineers for ACF valves. Lewis F. Maldeis will cover the general Pittsburgh area, including parts of Ohio and West Virginia; while Robert D. Butler will cover Florida, Georgia, Alabama, Mississippi, and western Tennessee.

BASIC ENGINEERING CONCEPTS SPAN BOTH TIME AND SPACE

Engineers for 52 years . . . **J. E. SIRRINE COMPANY**

GREENVILLE • SOUTH CAROLINA

A DEPARTMENTALIZED ENGINEERING ORGANIZATION SERVING BUSINESS, COMMERCE AND INDUSTRY

The Paper Industry Association News

All Phases of Industry to be Discussed at CPPA Meeting

The 1954 summer meeting of the Technical Section of the Canadian Pulp & Paper Association will be held June 14-17 at the Empress Hotel in Victoria, B. C.

Program committees are preparing the final schedule for the four-day gathering, and it is expected that all phases of pulp and paper manufacture will be covered. Although the program is as yet tentative, a partial list of topics to be treated is as follows:

Drying of Newsprint, The Use of Fans, High-Yield Sulfite Pulping, An Electrode for Measuring pH During Sulfite Pulping, Factors Affecting the Clean Blowing of Sulfite Digesters, Current Sceening Practice in Sulfite Mills, Preventive Maintenance Programs, New Developments in Engineering, Causticizing Practices, Liming of Liquor Lines, Translation of Results from a Miniature Grinder to Mill Scale Operation, Conversion of News Groundwood Mill to Roto, New Developments in Newsprint Machines, By-Product Power Plant Design and Control Problems, Extractives from Wood and Bark, Turbulent Diffusion Phenomena on a High-Speed Newsprint Machine (a report of an investigation at Powell River Co. Ltd.), and The Role of the Pulp Mill in an Integrated Wood Utilization Program.

Industry "Man Minded," Kalamazoo Tappi Told

The old policy of paying too much attention to machines and ignoring manpower has changed radically in the paper industry, according to George H. Pringle of the Mead Corp., national president of Tappi. He spoke in April at a dinner meeting of the Kalamazoo Valley Section of Tappi.

In "human engineering" there is a drastic need for better communication systems from top management to the lowest paid hourly worker, he said. Staff meetings held frequently on different levels provide one solution to this problem.

Another answer is provided by Mead, of which Mr. Pringle is vice president. The firm publishes a daily one-page bulletin that is placed in each department to keep all phases of the operation in touch with each other.

Empire State Tappi to Feature Stream Improvement Discussion

Experts in the field of stream improvement will stage a panel discussion on problems of pollution at the annual meeting of the Empire State Section of TAPPI. The gathering will be held June 10-12 at the Whiteface Inn, Lake Placid, N. Y.

Participating in the symposium will be Dr. Harry Gehm of the National Council for Stream Improvement; R. M. Drummond of the Research Division of International Paper Co.; W. H. Larkin of the Water Pollution Control Section of the New York State Department of Health, and Vance P. Edwards, consultant.

The speakers scheduled to appear on the technical program are as follows: Carl M. Noble, Electric Eye Equipment Co., "The Hurletron Caliper Control System;" Sam Orton Jr., Orton Corp., "The Rotabelt;" Ralph Russell, National Paperboard Association, "Odor Control in Board for Food Packaging;" J. W. Jelks, Denver Equipment Co., "Flotation Deinking;" Robert Jacobs, Dilts Machine Works Div. of the Black-Clawson Co., "The Application of Polyethylene and P. E. Wax Blends by Extrusion and Roller Coater Methods;" J. D. Sisson, St. Regis Paper Co., "Modification of Plastic Films for Specific Packaging Needs," and J. P. Bainbridge Jr. of Monsanto Chemical Co. and B. A. Weimer of E. I. duPont de Nemours & Co., "New Products of Interest to the Paper Industry."

E. D. Jones & Sons Co. will make available the movie, "The Ancient Art of Chinese Papermaking," which will be shown following the technical session. Social events will include golf, trapshooting, a boat excursion on Lake Placid, and dancing.

Supts. Announce Meeting Dates

Three divisions of the Superintendents Association have announced the dates for their regular fall meetings.

Clyde G. Jones of Ecusta Paper Corp., chairman of the Southeastern Division, has announced that the 1954 joint fall meeting of the Southern and Southeastern divisions will be held October 13-15 at the George Vanderbilt Hotel in Asheville, N. C.

Charles I. Horton, secretary-treasurer of the Connecticut Valley Division, reports that the fall meeting of the group will be staged October 9 at the Berkshire Inn, Great Barrington, Mass. Divisional chairman is Edward McQuillan of American Writing Paper Corp. in Holyoke.

Kimberly Addresses NPTA

John R. Kimberly, executive vice president of Kimberly-Clark Corp. and a vice president of APPA, addressed a session at the recent annual convention of the National Paper Trades Association. The gathering was staged in New York, N. Y. "The paper industry," he declared, "despite being a mature industry, is still a growth industry, with its increase well above the national average and with product demand still rising."

At a panel discussion, the results of an NPTA supplier preference survey were announced. It was shown that merchants look for, in order: product quality, supplier sales policies that definitely protect the merchant, assured allotments in tight periods, and suggested resale schedules for distributors.

Gardner Executive to Address Special AMA Conference

The facts needed to solve 1954's labor relations problems will be discussed at a special American Management Association conference on collective bargaining at the Hotel Astor in New York, N. Y., June 7-8. More than 700 personnel and labor relations executives are expected to attend.

Speakers from seven companies and four publications will brief management negotiators for a summer of downbeat bargaining. Areas to be covered include contemporary union demands, wage settlements, and labor strategy; the economic outlook and its relationship to contract negotiation; preparing for negotiations; bargaining for an improved contract; handling crisis negotiations, and merchandising the union contract.

Two company demonstrations will present case studies in preparing for bargaining and merchandising the labor contract. Richard L. Siegel, director of industrial and public relations for Gardner Board & Carton Co. of Middletown, Ohio, will join other Gardner representatives in describing that company's integrated program of industrial relations research, management-employee communications, and executive cooperation in preparing for negotiations.

Coming Events

TAPPI

May 14—Southeastern Section, Hotel DeSoto, Savannah, Ga.
May 20-21—Pacific Section (joint meeting with Pacific Coast Superintendents), Gearhart Hotel, Gearhart, Ore.
May 24-26—Fifth Coating Conference, Poland Spring House, Poland Spring, Maine
May 27—Delaware Valley Section (E. J. Albert Award program), Engineers' Club, Philadelphia
June 10-12—Empire State Section (annual meeting), Whiteface Inn, Lake Placid, N. Y.
July 12-24—Third Statistics Conference, University of Maine, Orono, Maine

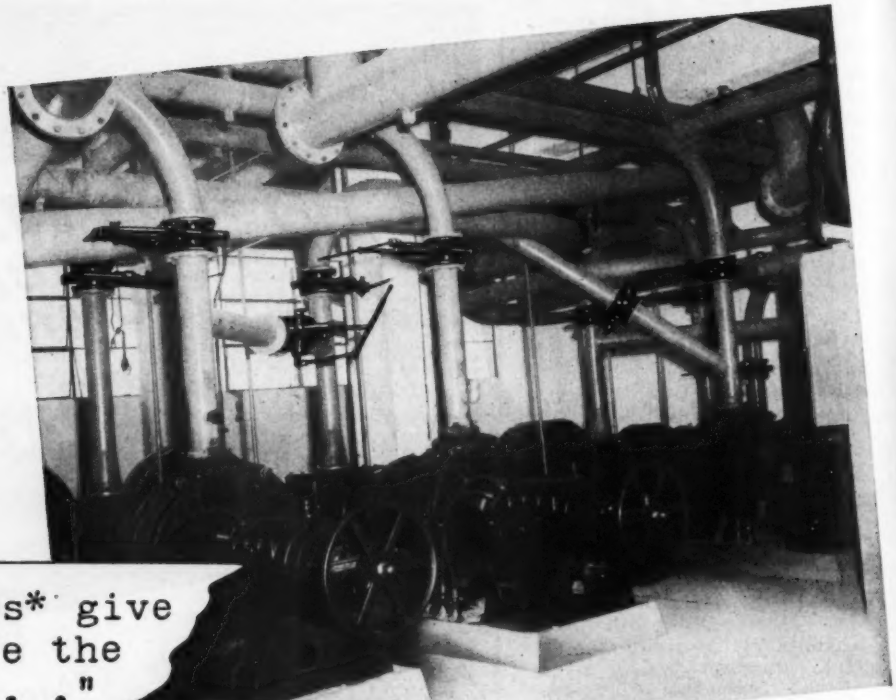
American Pulp & Paper Mill Superintendents Association

May 14—Connecticut Valley Division, Rogers Smith Hotel, Holyoke, Mass.
May 14-15—Pennsylvania-New Jersey-Delaware Division, Yorktowne Hotel, York, Pa.
May 20—Michigan Division, Hotel Harris, Kalamazoo, Mich.
May 20-21—Pacific Coast Division (joint meeting with Pacific Section Tappi), Gearhart Hotel, Gearhart, Ore.
June 4—Miami Valley Division, Orr Felt & Blanket Co., Piqua, Ohio
June 21-23—National Meeting, Sheraton-Mount Royal Hotel, Montreal, Que., Canada
Sept. 2-4—New York-Canadian Division, Saranac Inn, Upper Saranac Lake, N. Y.

Other meetings

May 17-20—Basic Materials Conference and Exposition, International Amphitheatre, Chicago
May 23-25—National Paperboard Association (spring meeting), Grove Park Inn, Asheville, N. C.
May 31-June 11—Seventh Canadian International Trade Fair, Toronto, Ont., Canada
June 14-17—CPPA Technical Section (summer meeting), Empress Hotel, Victoria, B. C., Canada
July 13-15—Western Plant Maintenance Show, Pan Pacific Auditorium, Los Angeles.
Aug. 17-19—Fifth Western Packaging & Materials Handling Exposition, Civic Auditorium, San Francisco

®NASH
INSTRUMENT AIR COMPRESSOR
Produces only ®Clean Air without dust, heat or oil. No oil traps. No dust filters. No after-coolers . . . Ask for Bulletin 374.
®Registered Trade Marks of The Nash Engineering Co.
NASH
PAPER MILL
NASH ENGINEERING COMPANY
423 WILSON AVE., SO. NORWALK, CONN



"your valves* give about twice the service . . ."

Recent installation showing variable control of stock flow to Jordans or Refiners.

*Sandy Hill Gate Valves...of course

IT ISN'T JUST BY CHANCE that Sandy Hill Quick Opening Gate Valves give so much better service than other valves, as the above quotation from an enthusiastic user states. The reason is that these are *NOT ordinary valves*. Like most Sandy Hill products, they are especially designed and built for a specific purpose . . . in this case, the effective handling of pulp and paper stock and water under low pressure. Recommended and sold solely for controlling the flow of solids in suspension, such as pulps or slurries. They perform this function adequately, capably and long *BECAUSE:*

They are sturdily constructed and easily installed.

They can be opened in a fraction of the time required with screw valves.

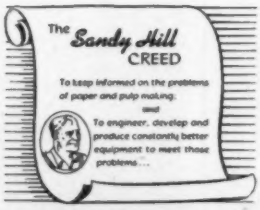
Slides can be held at any desired opening, and can be easily removed without taking valve from line.

Clogged valves can be cleaned by simply loosening and turning bottom plate.

Construction materials may be specified to resist any type of chemical exposure.

Stem end is cut standard pipe thread, permitting extension by connecting a piece of pipe. No threads on working part of stem to wear out.

If you are interested in the expeditious handling of fluid pulps and slurries, with economical, trouble-free, low-maintenance, long term service, consult us.


The Sandy Hill CREED
To keep informed on the problems of paper and pulp making,
and
To engineer, develop and produce constantly better equipment to meet those problems....

THE Sandy Hill IRON & BRASS WORKS
HUDSON FALLS, N.Y.

The Paper Industry Names in the News

T. M. Gilbert

G. M. Gilbert

T. M. Gilbert Named President of Gilbert Paper

At a recent meeting of the board of directors Theodore M. Gilbert was elected president of Gilbert Paper Co. of Menasha, Wis. He succeeds George M. Gilbert, who announced his retirement effective April 1.

The new president has been associated with the Gilbert firm since 1923, at which time he served as secretary. He was named a director in 1925, treasurer in 1926, and vice president in 1947.

G. M. Gilbert, who has served as president since January of 1951, completed his 40th year with Gilbert Paper in August of 1953. He will continue as a director.

Succeeding T. M. Gilbert as vice president is Gilbert Megargee, a director of the company. Arthur C. Haselow continues as secretary and treasurer.

D. L. Luke III

E. C. Williams Jr.

Westvaco Elects Two Directors

Stockholders of West Virginia Pulp & Paper Co. have elected two new directors: David L. Luke III and E. Crawley Williams Jr.

Mr. Luke is a vice president responsible for liaison with the firm's subsidiaries, the coordination of research and planning and broad financial studies; Mr. Williams is resident manager of the Covington, Va. plant. They succeed Fred A. Coe, former manager of the Mechanicville, N. Y. plant who retired March 1, and Henry F. Harrison, a former vice president. Mr. Harrison will be 87 in September and was the first employee hired by the original company following its organization in 1888.

Southern Paperboard Appointments

Charles McCarthy, vice president of Southern Paperboard Corp. at Port Wentworth, Ga., recently announced two appointments at the paper mill.

Mack A. Higdon was named paper mill superintendent, and John E. Rogers was made paper mill tour foreman. Mr. Higdon, who joined the firm as tour foreman in 1948, is a graduate of Western Carolina Teachers College. Mr. Rogers became associated with Southern Paperboard in 1948 as a machine tender.

Container Corp. Names Two Vice Presidents

Donald H. Brewer and Leo H. Schoenhofen have been made senior vice presidents of Container Corp. of America.

Mr. Brewer, formerly vice president in charge of the firm's central folding carton and boxboard division, will be in charge of Container Corp.'s container plants and containerboard mills east of the Rockies, including those of O. B. Andrews Co., a subsidiary. In the same territory, Mr. Schoenhofen will be in charge of all folding carton plants and boxboard mills of the parent company and of O. B. Andrews, in addition to the paper stock plants of another subsidiary, Pioneer Paper Stock Co. He was formerly vice president for the eastern folding carton and boxboard division.

Container Corp.'s California subsidiary, California Container Corp., has announced the following promotions: Walter L. Sweeney as assistant general manager of the Los Angeles shipping container operations; William P. Peters as general manager of the folding carton plants at Portland, Ore., and Seattle, and Fred A. McFarland as general manager of the folding carton operations in the San Francisco Bay area.

J. A. May

W. M. Ebersole

Macon Kraft Appointments

James A. May, assistant to the vice president and general manager, has been named resident manager of Macon Kraft Co. in Macon, Ga. Also, William M. Ebersole, general superintendent since January 1952, has been promoted to the post of manager of production. The announcement was made by Herbert A. Kidd, vice president and general manager. (Macon Kraft is jointly owned by the Mead Corp. and Inland Container Corp.)

Mr. May, a native of Ohio, joined the Mead staff in 1920 and with the exception of one year at the Kingport Div. was located at the Chillicothe headquarters until 1949, when he was transferred to Macon.

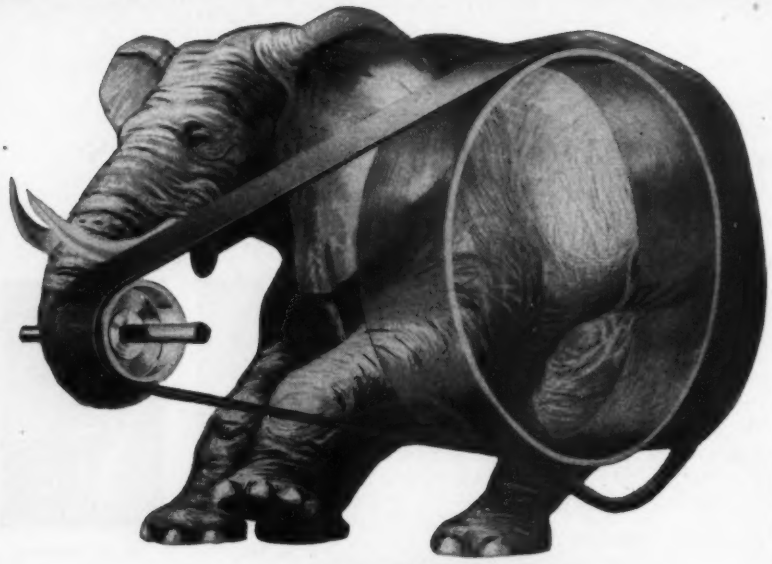
A graduate of the University of Alabama, Mr. Ebersole was associated with Gulf States Paper Corp. and St. Joe Paper Co.

R. C. Barienbrock

W. H. Hildebrand

Mead Centralizes Wood Procurement; Promotes Three

The Mead Corp. has announced the centralization of its wood procurement activities and the promotion of three woods department staff members to new positions. R. C. Barienbrock has been appointed director of wood procurement; W. H. Hildebrand has



PULLINGRIP

G&K Leather Belting grips the pulleys for more production-power

It Grips — Like an elephant's trunk, leather's resilient, frictional surface firmly *grips* the pulley face, causing belt and pulley to move as one power unit.

It Pulls — Leather is strong, flexible, with controlled stretch — gives peak performance on *any* drive.

It's 3-Dimensional — Leather's millions of fibres are interlaced to form the tough *three-dimensional* structure so necessary for PULLINGRIP — *developed to the highest degree in G&K Leather Belting.*

Call your G&K Industrial Supplies Distributor for flat, round, link and V-belting, belt lacing, dressings, cements, packings and specialty leathers. Write for free Belting Catalog 101.

B-8

GRATON AND KNIGHT

Memo: **Paper Mill Superintendents**

Here's a drive you can depend on — if the belting is G&K leather. Every drive in the mill — from beaters to take-off reels — must keep pulling at top efficiency with minimum stretch. That's why superintendents specify G&K RESEARCH® brand for top tonnage output.

GRATON & KNIGHT *Company*

WORCESTER, MASSACHUSETTS

World's Largest Manufacturer of Industrial Leather Products

Names in the News . . .

been named northern wood procurement manager, and A. K. Mock will serve as Appalachian wood procurement manager.

Mr. Barienbrock has been with Mead since 1941, becoming woods department manager for the Kingsport Division in 1942. Wood procurement for the Columbian Division at Bristol was added to his responsibilities in 1945. Mr. Hildebrand joined Mead in 1948 after five years as manager of the wood department of Munising Paper Co. From 1948 to 1951 he was manager of wood and lands for Mead's Michigan Division, after which he joined the woods staff at Chillicothe. Mr. Mock became a wood buyer in 1929.

Champion Appoints Bendetsen Texas Division Manager

Vice President W. R. Crute of the Champion Paper & Fibre Co. has announced the appointment of Karl R. Bendetsen as manager of the firm's Texas Div. pulp and paper operations.

Mr. Bendetsen joined Champion two years ago as a general consultant and assistant division manager. Prior to his association with the Pasadena, Texas mill, he had served three years in the army. He is a native of the State of Washington and practiced law on the West Coast before joining the armed forces.

K. R. Bendetsen

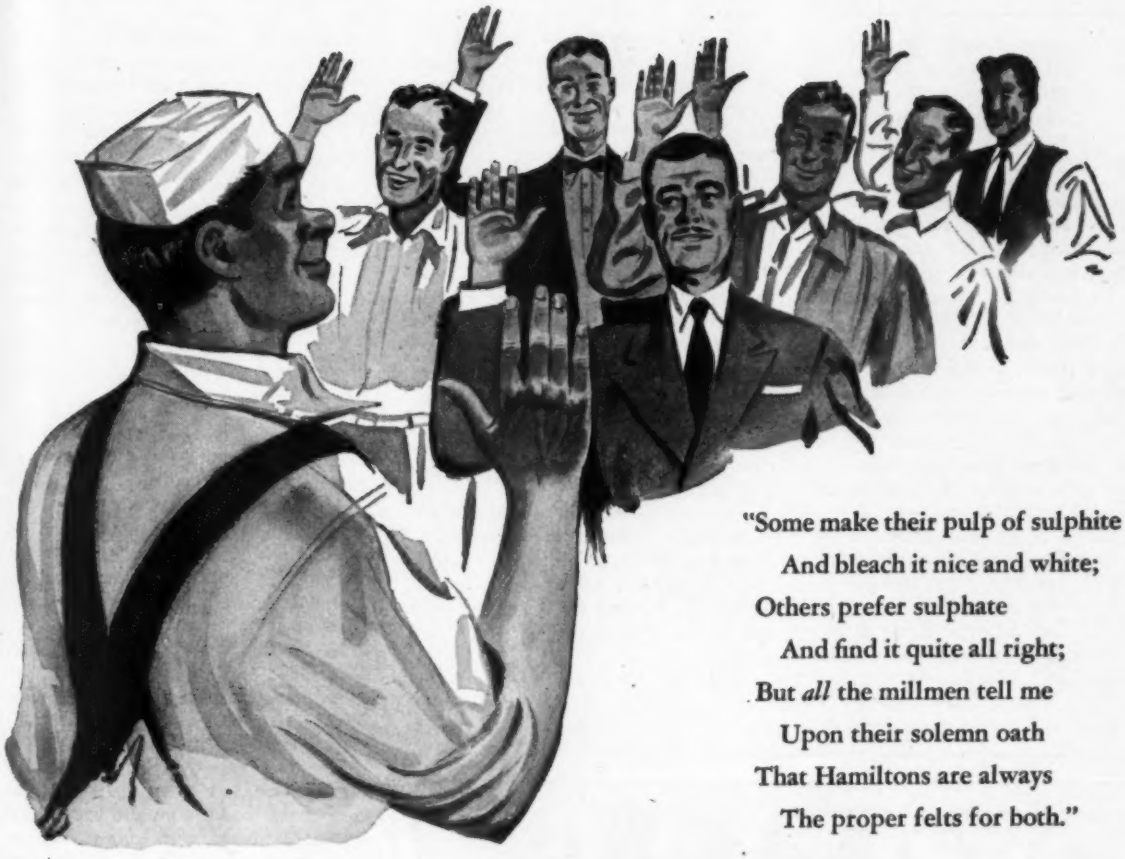
P. H. Glatfelter III

P. H. Glatfelter Elects Youngest President

P. H. Glatfelter Co. of Spring Grove, Pa., has announced the election of the youngest president in its 90-year history. He is Philip H. Glatfelter III, 38, who represents the fourth generation of the Glatfelter family to serve as head of the firm. His father, P. H. Glatfelter, whom he succeeds, will continue as chairman of the board; he had been president 25 years.

A 1938 graduate of Brown University, the new president began his career in the maintenance department of the Glatfelter firm, later being as-

HAM FELTZ SAYS



"Some make their pulp of sulphite
And bleach it nice and white;
Others prefer sulphate
And find it quite all right;
But *all* the millmen tell me
Upon their solemn oath
That Hamiltons are always
The proper felts for both."

"I suppose most millmen have more than one source of supply for felts. No sense in having all their eggs in one basket. But it is remarkable how many superintendents *prefer* Hamilton Felts to keep drying costs down while production goes up.

"It's just possible that this preference for Hamilton Felts is because Hamiltons, with their larger open spaces between threads, let water run through faster while their thick, silky nap gives a finer finish without leaving felt marks in the sheets."

From the thinnest tissue to the heaviest board there is a Hamilton Felt that will do your work better, faster and at lower cost.

Hamilton Felts

MIAMI WOOLEN MILLS

Established 1858

SHULER & BENNINGHOFEN, HAMILTON, OHIO

signed to manufacturing, purchasing and sales. He was made a director in 1944 and executive vice president in 1948. Mr. Glatfelter became president of a subsidiary firm, the Glatfelter Pulp Wood Co., in 1952.

Maine Alumni Prominent In Pulp and Paper Technology

Twelve men who have studied pulp and paper technology or allied courses at the University of Maine in Orono are now on the faculties of schools and colleges throughout the country that offer such training. On the occasion of the 40th anniversary of Maine's pulp and paper curriculum, the school revealed the following graduates or former students who are now associated with principal institutions in professorial capacities:

Horace W. Lee, '11, B. S. in biology, is at the Lowell Institute as instructor in charge of paper technology and microscopy and testing.

Prof. C. Earl Libby, '16, heads the new curriculum in pulp and paper technology at the School of Forestry of North Carolina State College of Agriculture and Engineering, Raleigh. He was formerly head of the department of pulp and paper manufacture at the College of Forestry of the State University of New York in Syracuse.

Lyle C. Jenness, who received his master's degree in mathematics in 1925, is professor and head of Maine's department of chemical engineering. He is also one of the directors of the Pulp and Paper Foundation.

John Lewis, B. S. '43 and M. S. '48, is professor and head of the department of paper engineering at Lowell Technological Institute.

Shu-Tang Han, M. S. '47, is on the staff of the Institute of Paper Chemistry in Appleton, Wis.

Andrew J. Chase, B. S. in chemical engineering in '49 and M. S. '51, is assistant professor of chemical engineering at Maine.

John F. Gorham, M. S. '52, is instructor in chemical engineering at Orono.

Norwood H. Keeney Jr., M. S. '50, is assistant professor in chemical engineering in charge of paper converting courses at Lowell. He succeeded Alfred K. Hobbs, B. S. '50 in pulp and paper, who is now serving in the army.

James E. Ayer, M. S. '51, is assistant professor of chemistry at the University of Alabama and is in charge of the development of the new division of pulp and paper technology within the School of Chemistry, Metallurgy and Ceramics.

Harold R. Hickson, B. S. '51 is a research associate in the department of pulp and paper manufacture at the College of Forestry in Syracuse.

Charles M. Howell, a graduate of Swarthmore and holder of a master's degree from Maine, is a professor in paper technology at Orono.

Alfred H. Nadelman, who is a professor of pulp and paper technology at Western Michigan College in Kalamazoo, was a summer session student in 1941, and Lewis P. Newton, M. S. '51, is a research assistant and assistant professor of chemistry at the same school.

Hammermill Promotions

Fred Bahrenburg, head of the production department for Hammermill Paper Co. for the past six years, has been promoted to the newly created position of assistant general superintendent. He will head manufacturing, traffic and production for the Erie, Pa. firm.

In another major appointment, Dr. Donald T. Jackson, formerly head of Hammermill's research and development department, has been made technical director of the Erie mill.

A recent change in the Hammermill organization has been the consolidation of the wood room and transportation departments, with John C. Wilson as superintendent. A. J. Aubin, formerly superintendent of transportation, is Mr. Wilson's assistant.

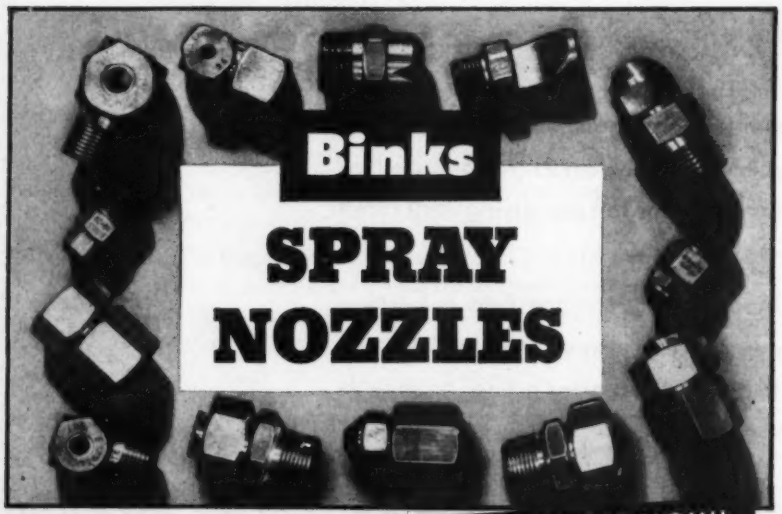
Clauson Heads Swedish Concern's American Subsidiary

Karl A. Clauson has been elected president of Stora Kopparberg Corp., the American subsidiary of Stora Kopparbergs Bergslags A/B of Falun, Sweden. The firm is a manufacturer of wood pulp, newsprint, iron and steel.

Mr. Clauson, who is a vice president of Parsons & Whittemore Inc., was at one time executive secretary of the Association of Pulp Consumers Inc. Elected vice president and treasurer of the subsidiary was George N. Dutcher; Ralph E. Hanssen was named assistant secretary and traffic manager.

Thomas B. Farwell has resigned as general manager of Ryegate Paper Co. of East Ryegate, Vt. He joined the firm in 1926 and was named general manager in 1938.

Lester J. Smith, who was manager of St. Regis Paper Co.'s mill in Harrisville, N. Y., at the time it was



for chemical spraying, cooling, humidifying, dehydrating, and hundreds of other applications.

You'll get the right nozzles quicker by calling Binks...manufacturers of one of the most complete nozzle selections ever produced.

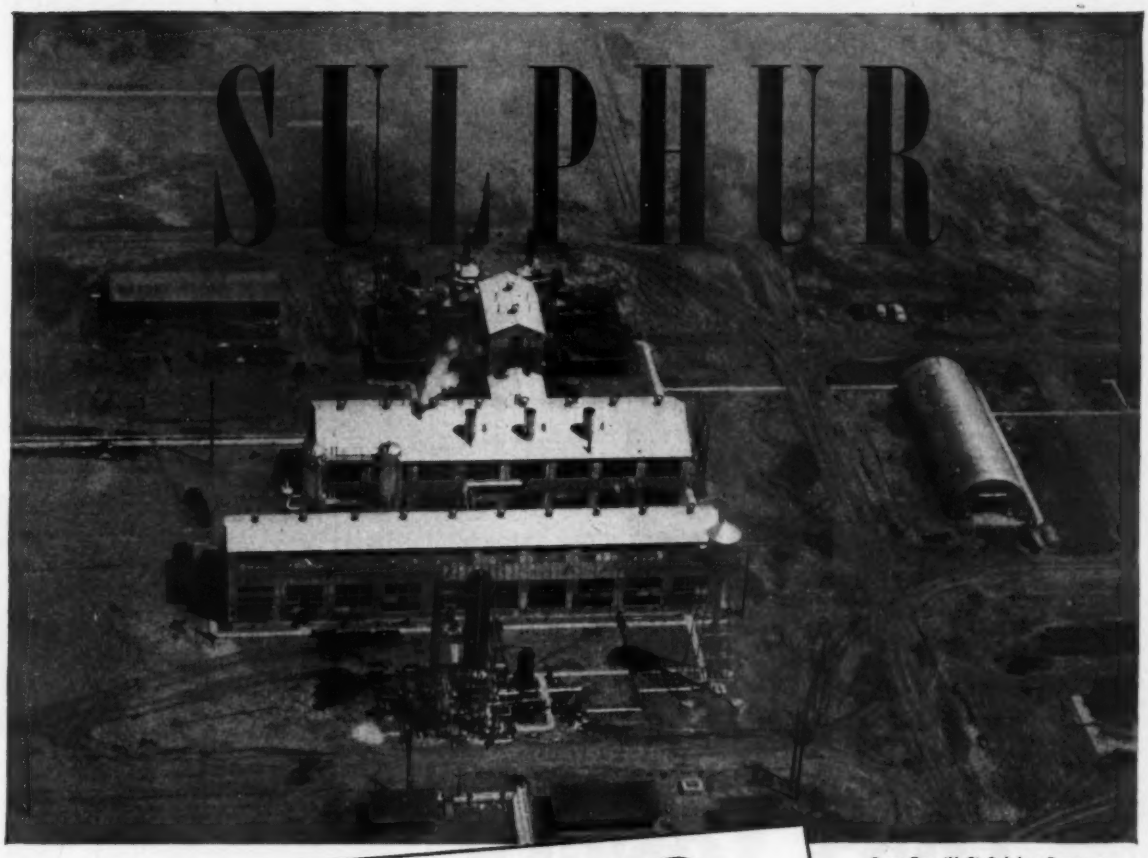
You'll have a wide range of spray patterns, sizes, capacities from which to choose...with nozzles cast or machined from any standard or special corrosion-resistant metals. Send for comprehensive catalog.

Binks Manufacturing Company
3118-32 Carroll Ave., Chicago 12, Ill.

MAIL COUPON NOW!

Binks Manufacturing Co.
3118-32 Carroll Ave.,
Chicago 12, Ill.
O.K. Binks, send me your Spray Nozzle Catalog...

Name_____
Company_____
Address_____
City_____ Zone____ State____



Sour Gas (H_2S) Sulphur Recovery Plant, Worland, Wyoming.

Sour Gas...

...an increasingly important source

The largest elemental sulphur producing area in the world today is a narrow belt along the Coast of the Gulf of Mexico. Large quantities of elemental sulphur lie in natural beds in Japan, Italy, the Andes Mountains of South America, as well as many other sections of the world.

Most of the natural gas coming from fields on the East slope of the Rocky Mountains contains hydrogen sulphide rendering the gas "sour." The recovery of the sulphur from this gas, thereby purifying it, is a feat of chemical engineering.

Both metallurgy and chemistry combine in Canada, Norway, Sweden, Spain, Portugal, Germany, Great Britain, Holland and Egypt to produce substantial quantities of elemental sulphur from sulphides of hydrogen, iron and oil shale.

This company has the largest single unit in the world at Worland, Wyoming, recovering elemental sulphur from hydrogen sulphide contained in sour gas.

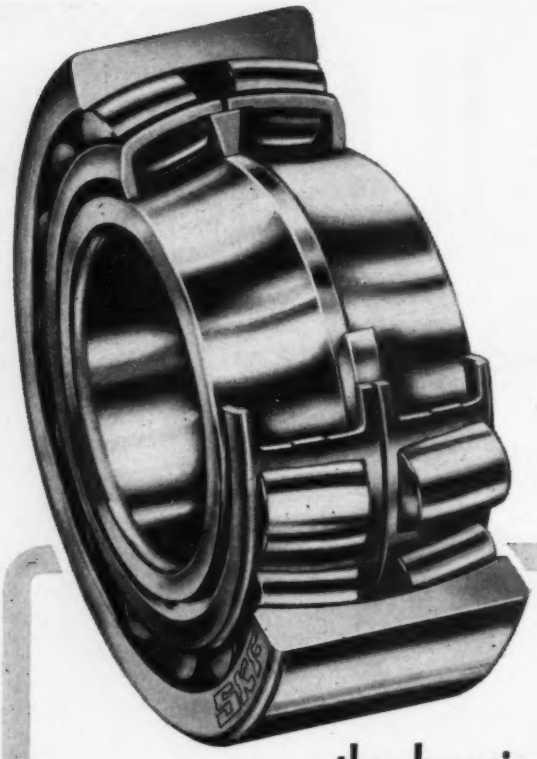
Texas Gulf Sulphur Co.

75 East 45th Street, New York 17, N. Y.

Sulphur Producing Units

- **NEWGULF, TEXAS**
- **MOSS BLUFF, TEXAS**
- **SPINDLETOP, TEXAS**
- **WORLAND, WYOMING**

CHEMICAL PROGRESS WEEK-MAY 1954



the bearing that

LIVES LONGER

comes from **SKF**

For your next replacement job, why not buy the spherical roller bearing that will *last* up to 3½ times longer than any other available design?

That's right—SKF's *improved* (Type "C") Spherical Roller Bearing *will* provide, size for size, 2 to 3½ times more life, and up to 50% increased capacity *. . . at no increase in cost.*

Your nearby SKF Distributor can show you how the original SKF Spherical design has been improved to reach this higher performance level, and, in the most popular series, can supply your requirements promptly from his stock. Remember—your SKF Distributor is a trained specialist in helping industry *put the right bearing in the right place.* **SKF INDUSTRIES, INC.,** PHILADELPHIA 32, PA.— *manufacturers of* **SKF** *and* HESS-BRIGHT® *bearings.*

7532

SKF®

BALL AND ROLLER BEARINGS

Names in the News . . .

sold last November, is continuing his association with the firm in northern New York. He is presently engaged on special manufacturing projects.

Henry J. Howlett has joined Robert Gair Co. Inc. as a special representative for the container division. Mr. Howlett was formerly president of Container Laboratories, New York consulting engineers, and was at one time vice president of Piggly Wiggly Corp.

H. J. Howlett

R. E. Harper

Robert E. Harper has been appointed director of purchases for Rhinelander Paper Co. in Rhinelander, Wis. He has been with the firm since 1932 and in 1953 was appointed assistant to the vice president in charge of operations.

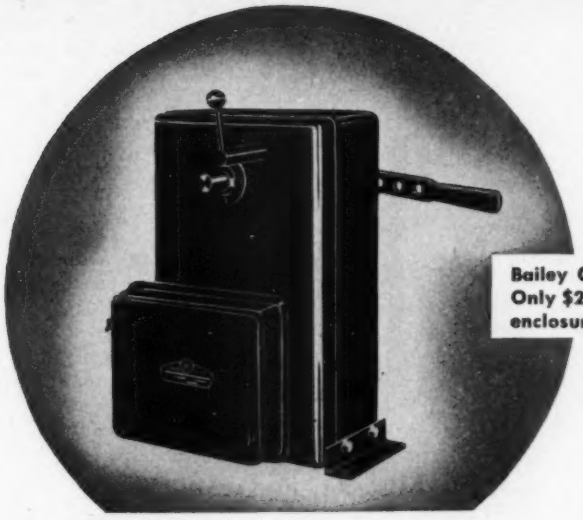
Frederic R. Mann of Philadelphia, chief executive and formerly principal stockholder of Seaboard Container Corp., has become chairman of the executive and finance committee of National Container Corp. He is National Container's second largest stockholder.

Vernon E. Johnson, president of Canadian International Paper Co., has been elected president of Commercial Alcohols Ltd.

E. L. Lamb has been named production assistant to the executive vice president of Minnesota & Ontario Paper Co.

George V. Johnson, who was at one time on the staff of the Writing Paper Manufacturers Association, has joined the American Paper & Pulp Association in the industrial relations department.

Edwin W. Schoenberger, dean of students at the Institute of Paper Chemistry, has been elected president of the Appleton, Wis. Rotary Club.



Bailey Control Drive, Type AC44P Model 200. Only $210.00 F.O.B. Cleveland, complete with enclosure, positioning relay and hand operator.

Want Better Flow Characteristics from Your Regulating Devices?

This new, small, piston-operated Bailey Control Drive will improve the flow characteristics of butterfly valves, dampers, hydraulic couplings, feeders and similar regulating devices. Adjustment is simple; any desired relation between drive motion and pneumatic signal may be secured.

You can install this compact pneumatic drive power unit in any position on a column, pipe, or flat surface—and connect it to the regulating device with standard Bailey linkage, available from stock.

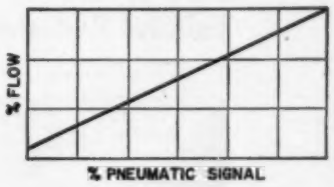
Speed (time required for full travel) is adjustable to suit your requirements. Bailey Control Drives operate on standard SAMA pneumatic signal ranges of 3 - 15 or 3 - 27 psig.

AVAILABLE FROM STOCK in 3 standard sizes

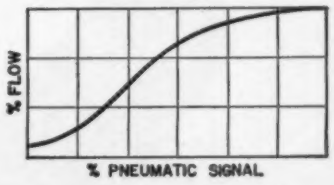
Type	Piston Dia. Inches	Piston Stroke Inches	Torque ft-lb	Max. Travel Degrees	Approx. Dimensions Inches
AC816	8	16	1500	90	13 x 27 x 51
AC68	6	8	400	90	13 x 19 x 34
AC44	4	4	75	75	10 x 11 x 19

P-28

The New Bailey Control Drive gives you THIS—



instead of THIS



BAILEY METER COMPANY

1058 IVANHOE ROAD

CLEVELAND 10, OHIO

Complete Controls for Process Plants

BAILEY METERS

Controls for

TEMPERATURE
PRESSURE
GAS ANALYSIS
FLOW LEVEL
RATIO

FOR MORE INFORMATION
FILL OUT AND MAIL

☐ I am interested in Bailey Control Drives. Mail me Spec. CA04

☐ I am interested in Bailey Control Linkage. Mail me Spec. CA042

Name _____

Title & Company _____

Street & Number _____

City & Zone _____ State _____

Names in the News . . .

George Rentmaster has been named floor supervisor for Charmin Paper Mills Inc. of Green Bay. Replacing him as tour foreman is **Norbert Stordeur.**

C. R. Chamberlain, manager of the Lynchburg, Va. wood office of West Virginia Pulp & Paper Co., has assumed responsibility for the operation of the wood department at the Covington mill. He replaces **G. L. Knaplon,** who retired April 3.

Averill J. Wiley, technical director of the Sulphite Pulp Manufacturers' Research League of Appleton, Wis., has received a certificate of merit from the Nash Conservation Awards Program. The presentation was "for his outstanding contributions in reducing sulfite stream pollution through industry-sponsored research."

Scott S. Hoffman has been named sulfite superintendent for Hammermill Paper Co., Erie, Pa.

Oliver H. Stieber has been named general traffic manager for Gaylord Container Corp. to succeed the late Ernest D. Grinnel. Mr. Stieber joined the firm in 1947 and was formerly assistant general traffic manager.

Gerald E. Wing of Waterville, Maine, has been named manager of woodlands for the northern woods operations of Hollingsworth & Whitney Co. Formerly associated with Great Northern Paper Co., he joined the H & W staff in 1949 as assistant manager of woodlands. Mr. Wing succeeds **O. A. Sawyer,** who retired March 31 after 48 years with the firm.

Herbert E. Nylund was recently elected treasurer of Crown Zellerbach Corp. to succeed **A. L. Bennett,** who resigned because of illness. Mr. Nylund joined the firm in 1936 and since 1951 has been assistant treasurer. Named assistant treasurer to succeed Mr. Nylund was **William H. Keplinger,** C-Z credit supervisor.

Charles H. Sage, vice president of Kimberly-Clark Corp. in Neenah, Wis., has been reelected chairman of the Forest Industries Council, policy coordinating organization of the lumber, paper, pulp and pulpwood industries.

C. J. Warwick Fox has been elected president of Great Lakes Paper Co. Ltd. Appointed vice president and general manager last October, Mr. Fox will continue to hold the latter post. He succeeds W. Earl Rowe, president and general manager since 1938, who remains with the firm as a director.

Sydney Ferguson, chairman of the board of the Mead Corp., has been chosen board chairman of Escanaba Paper Co. and its subsidiary, Upper Michigan Power & Light Co.; **E. G. Bennett** was named president of the two firms.

Newell E. Sawyer, 83, a pulp inspector for Eastern Corp., has announced his retirement after nearly 36 years of employment at the South Brewer, Maine mill.

Walter J. Cassidy, former product development manager for Sorg Paper Co. at Middletown, Ohio, has been named manager of the Technical Paper Div. of Whiting Paper Co. of Holyoke, Mass. He was formerly with American Writing Paper Corp. and Hawthorne Paper Co.

Robert J. Dull, formerly with Ohio Boxboard Co., has been named to the newly created post of chief engineer of Ottawa River Paper Co., Toledo converter.

Roy W. Shaver has been named vice president in charge of manufacturing for Alton Box Board Co., Alton, Ill. During his 37 years in the industry he has built and operated several paper mills and in the 1930s headed construction of the newsprint operation at Baie Comeau, Que. He succeeds **Roy H. Breyfogle,** who is retiring.

Richard C. Peterson has been appointed technical director of Bergstrom Paper Co. of Neenah, Wis. Since 1942 he has been with Riegel Paper Corp., recently in the special research and development section.

Consolidated Water Power & Paper Co. has made two appointments to the board of directors: **George W. Mead,** former president, and **H. P. Baldwin,** vice president and coordinator of plants and processes.

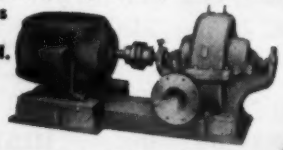
Philip H. Glatfelter III, recently named president and director of P. H. Glatfelter Co., Spring Grove. Pa., has been elected president of the Manufacturers' Association of York, Pa.

Faithful Performance on Important Jobs

— such as water supply, brine circulation, booster service, white water and overflow, hot well, makeup water, etc., etc.

Capacities to 1,200 G.P.M.

Heads to 460 Ft.



PUMPS by Aurora

For Every Purpose

TYPE-AD Aurora Horizontally Split Case, Back-to-Back Impellers, Two Stage Centrifugal Pump. Particularly suited to clear water and low viscosity liquids not containing solids. Write for BULLETIN 106

APCO TURBINE-TYPE PUMPS are unbeatable on low capacity, high head duties.

Capacities to 150 G.P.M. Heads to 500 Ft.

AURORA CENTRIFUGAL PUMPS are available in many types and sizes —all noted for their streamline coordination between impellers and shells.

Write for CONDENSED CATALOG "M"

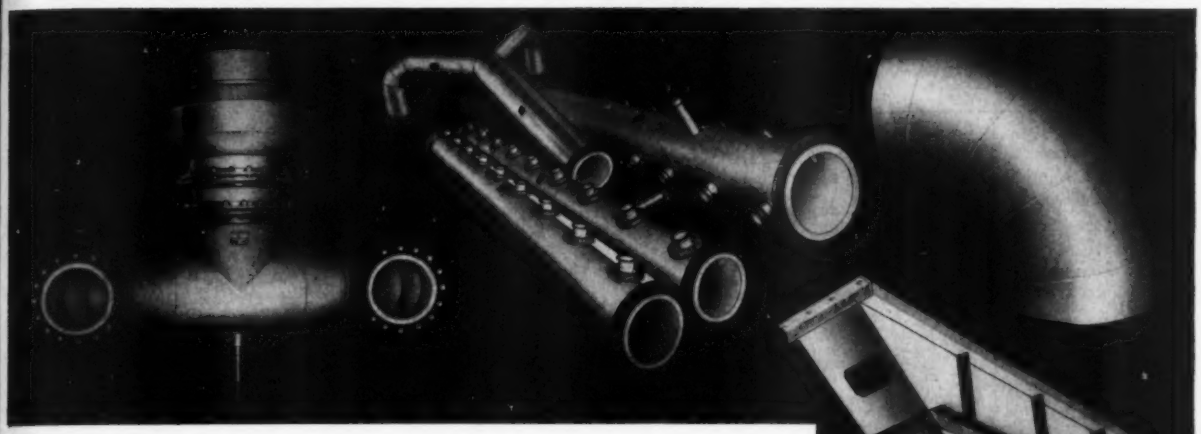
DISTRIBUTORS IN PRINCIPAL CITIES

AURORA Always PUMPS

AURORA PUMP COMPANY

DIVISION OF THE NEW YORK AIR BRAKE COMPANY

110 LOUCKS STREET, AURORA, ILLINOIS



design · fabrication

STAINLESS STEEL* NICKEL* INCONEL* MONEL*
EVERDUR HASTELLOY ALUMINUM CARBON STEEL

*Solid and clad

WOLFERZ
QUALITY-FABRICATORS

E. C. WOLFERZ
ALLOY EQUIPMENT

20 PARK STREET, BELLEVILLE, NEW JERSEY
TELEPHONE: BELLEVILLE 2-5667

Southern Representative
W. W. HENDERSON & SONS
P. O. Box 1085 Pensacola, Florida

Names in the News . . .

Fred A. Coe, resident manager ot the Mechanicville, N. Y. plant of West Virginia Pulp & Paper Co., has retired after 44 years with the firm. He was succeeded by **George N. Hoover Jr.,** assistant manager in charge of production for the last six years.

Wilbur M. McFeely, director of industrial relations for Riegel Paper Corp., has been elected a vice president of the firm. He joined Riegel in 1945 as assistant director of industrial relations and was elected to the board in 1953.

J. J. Forsythe has been named specialty engineer at International Paper Co.'s mill at Niagara Falls. After graduate work at the Institute of Paper Chemistry, Mr. Forsythe was associated with Fraser Paper Ltd. as chief chemist at the Madawaska mills and later with Waxide Paper Co. of St. Louis as technical director.

Sam Stein

M. Kimmelmann

R. E. Pentz

Donald Zucker

Oneida Paper Products Elects

The board of directors of Oneida Paper Products Inc. recently announced the election of new corporate officers. Oneida is manufacturer and color-printer of nationally-distributed specialty bags and flexible packaging materials. Plants are located at Clifton, N. J.; Baltimore, Md.; Fort Worth, Texas, and Los Angeles.

The officers are as follows: Sam Stein, president and treasurer; Malcolm Kimmelmann (production manager), vice president; Robert E. Pentz (sales manager), vice president; Donald Zucker, secretary, and Louis J. Stein, assistant secretary and treasurer.

Irving Zucker, past president, has been designated as chairman of the board, while Gerald Fox, past secretary-treasurer, has been named vice chairman.

Abitibi Power & Paper Co. Ltd. has announced the appointment of **R. J. Askin** to manage Abitibi's participation in the development of Tasman Pulp & Paper Co. Ltd. at Kawerau, New Zealand. He has been manager of the Abitibi Thunder Bay Division in Port Arthur, Ont.

Don W. Davis was recently made technical director for Milprint Inc. Prior to his appointment, he was supervisor of the material development section of Marathon Corp.

John R. Kimberly has been named to the board of directors of Neenah Paper Co., Neenah, Wis. He is a former director and at one time served as chairman of the board.

Do Your Wrapping and Labeling in **ONE AUTOMATIC OPERATION**

— Save on Time and Labor Costs

THIS MACHINE DELIVERS TEN WRAPPED, SEALED AND LABELED REAM PACKAGES PER MINUTE.

Fully automatic REAM WRAPPER and LABELER MACHINE • Only one operator required • Handles sizes ranging from HEAVIER through 23 x 35, bulk 1" to 3". Adjustable to your specific requirements • Larger sizes on request.

LABELING UNITS can be furnished for installing in efficient combination with your present wrappers

Our engineers are always available for consultation on your present problems or for special developments

Write, Wire or Call

GRISWOLD and JOHNS

Engineers and Builders of Special Automatic Equipment

111 W. Jackson Blvd., Chicago 4, Illinois

If You Want

1. More Uniform Sheet Moisture Control

2. Greater Production

This Offer Will Interest You:

The Armstrong Sheet Moisture Control for paper machines has been developed, and proven in service, to such a degree that we will let it prove itself in your mill on a *free trial basis* for 90-days.

We will ship you a complete control and supervise its installation. If it does not give you better control of sheet moisture than you are now experiencing or does not *completely satisfy you in every respect,* you may return it within 90-days and owe us nothing.

You will admit we must be sure of this Control or we could not afford to make such an offer.

It doesn't cost anything to take a look at Bulletin No. 268, describing the Armstrong Control. Just clip the coupon to your letterhead and mail it to us. There is no obligation.

ARMSTRONG MACHINE WORKS

816 Hoffman Street • Three Rivers, Michigan

MOISTURE CONTROL

INDIVIDUAL DRYER TEMPERATURE CONTROL

DRYER DRAINAGE TRAPS

THERMAL AIR ELIMINATORS

STEAM HUMIDIFIERS

• ● •

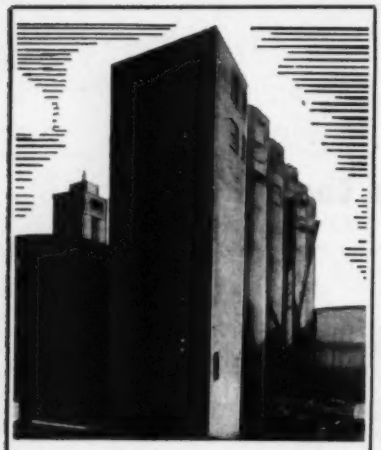
ARMSTRONG MACHINE WORKS

816 Hoffman Street, Three Rivers, Michigan

Please send Bulletin describing your Moisture Control for paper machines.

Name_____

(CLIP TO YOUR LETTERHEAD AND MAIL)



Save Man Hours

Equip Your Digester House

with a

HUMPHREY

Employees' Manlift

ELEVATOR

Eliminate stair climbing—save time—reduce employee fatigue. The endless belt provides continuous up and down transportation to and from sampling and operating floors.

Easy and safe to operate with ready-at-hand stop and go controls and the exclusive Humphrey Safety Features.

Can be installed in any Multiple Floor Building

Send us your requirements . . . we'll furnish complete information and prices.

HUMPHREY ELEVATOR COMPANY
Inc.
Since 1887
340 1st Avenue N. W.
Faribault, Minnesota

Export Sales Representative:
Scheel International, Inc.
4279 N. Lincoln Ave.,
Chicago 18, Ill.

The Paper Industry Necrology

Downing P. Brown

Downing Potter Brown, vice president in charge of administration for Brown Co., died recently in Boston. He was 66.

An authority on the pulp and paper industry, Mr. Brown was a native of Portland, Maine. He joined Brown Co. in 1908 and since that time — except for service in World War I — had been an officer of both Brown Co. of Berlin, N. H., and Brown Corp., of La Tuque, Que. He had recently relinquished the position of vice president in charge of sales.

D. P. Brown

B. E. James

Burton E. James

Burton E. James, 57, who had been associated with Beloit Iron Works for more than 25 years, died March 22 in a hospital at Madison, Wis. He was known throughout the paper industry as "Jimmy" James.

Mr. James was born in LaCrosse, Wis., and in 1921 was graduated from the engineering school of the University of Wisconsin. In 1927 he joined the staff at Beloit Iron Works, where he served as assistant chief engineer for a number of years prior to his death.

Frederick Coe Anderson, 81, former paper mill executive, died April 12 at his home in Watertown, N. Y. He became identified with the paper industry in northern New York in 1889 and later was associated with Taggart Bros. Paper Co., St. Regis Paper Co. and Outerson Paper Mills, serving as general superintendent and electrical engineer. He was later engaged in consulting work, principally in paper mill engineering.

George O. Comfort Sr., 85, who built and operated Monarch Paper Mill in Kalamazoo, died April 6 in Indianapolis, where he made his home after his retirement some years ago.

Walter Cloud Sr.

Walter Cloud Sr., 71, retired manager of U. S. Paper Mills Corp. of West DePere, Wis., died April 14. A native of Nobelsville, Ind., he was employed by two non-paper firms prior to joining the staff of Chicago Coated Board Co. in 1913.

From 1933 to 1936 he was manager of the Kansas City, Mo. plant of U. S. Gypsum Co. In 1936 he became manager at U. S. Paper Mills. Mr. Cloud was active in the Superintendents Association.

Robert E. Burkhardt, 62, general superintendent of the Kalamazoo, Mich. mill of St. Regis Paper Co., died March 31. He was formerly general manager of the old St. Regis mill in Norfolk, N. Y.

Orvis K. Jarret, president and general manager of Puritan Paper Plate & Products Co. of Quakertown, Pa., died March 13 at the age of 60.

Richard E. Thickens, 64, of Menasha, Wis., died in Chicago March 22. He was president of George Banta Publishing Co. and one of the founders of Banta Paper Co., forerunner of the present Central Paper Co. Mr. Thickens became ill while on a trip to the West Indies.

William Earle Walker, former president of Walker Paper Products Ltd. of Montreal, died March 28 at the age of 74. He was founder of Walker Paper Co. and in 1932 organized Walker Paper Products. Mr. Walker was also active in the development of several other firms, including Back River Power Co. Ltd. and Montreal Island Power Co., and was a member of the executive committee of the Canadian Pulp & Paper Association.

George L. Richmond, president and general manager of Bloomer Bros. Co. of Newark, N. Y., died

March 29 while on a Florida vacation. Mr. Richmond, who joined the firm in 1907, had been president since 1926.

L. R. Solodar, 56, assistant secretary-treasurer of Newman & Co. Inc. of Philadelphia, died April 2 at his home in Melrose Park, Pa. He had been with the firm 26 years.

Charles P. Wilber, 70, former New Jersey state forester, died April 5 in Trenton. He was credited with organizing the New Jersey State Forest Nurseries.

M. J. Stacom

Matthew J. Stacom, vice president in charge of research for Stacom Industries Inc. of Long Island City, died recently at the age of 63. He was the inventor of the Stacomizer, a unit for the extraction of cellulose from wood pulp.

Mr. Stacom, who founded Stacom Industries, devoted many years to experiments in methods of extracting the wealth from plant substances, particularly wood pulp. Four of the machines he developed are in use in Canada, and one is being installed this year by Eastman Kodak Co. in Tennessee.

Louis Newman, 46, a vice president of Newman & Co. Inc., died February 7 in Philadelphia. He had been with the firm 30 years.

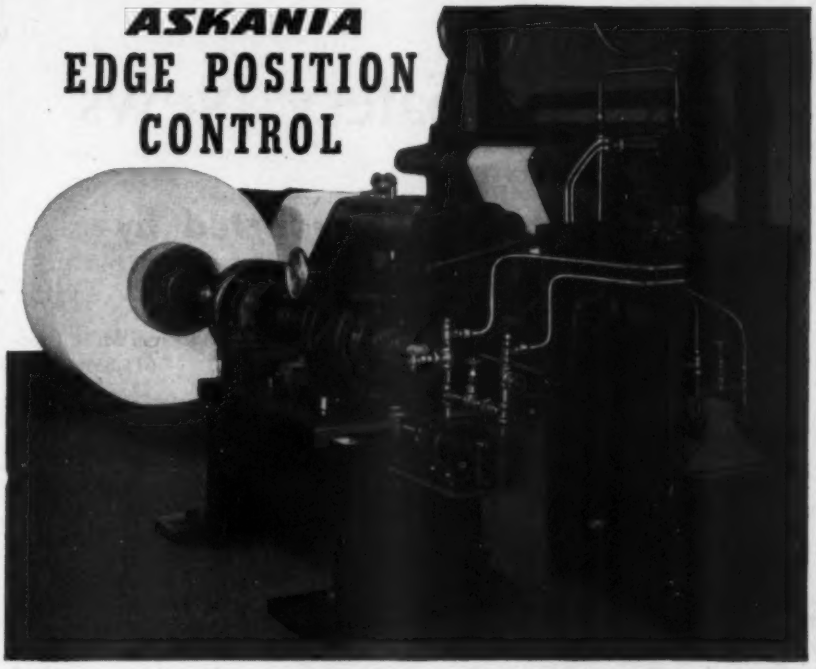
Earl R. Brown, 82, superintendent for Bergstrom Paper Co. from 1914 to 1943, died at his home in Little Chute, Wis., March 10. A native of Neenah, he was superintendent at a Kalamazoo mill before joining the Bergstrom firm.

John J. Ahern, 67, president and founder of Rapinwax Paper Co., Minneapolis, died February 20. He founded the firm in 1924 in St. Paul and moved it to Minneapolis in 1937.

Neil E. Salsich, 70, vice president and director of the Jeffrey Mfg. Co. of Columbus, Ohio, died February 2 in Bethlehem, Pa., while on a business trip.

Herbert J. Scruton, 68, former chief engineer for International Paper Co. at Fort Edward and Watertown, N. Y., died recently in Albany.

ASKANIA
EDGE POSITION CONTROL



. . . makes a new slitter out of an old one at KVP

At Kalamazoo Vegetable Parchment Co., Kalamazoo, Mich., Askania Edge Position Control was installed on this elderly Cameron slitter-rewinder. It has restored side register accuracy to make it equal to new machines.

"This is good control," says Ralph Clark, KVP engineer who designed the installation. "It's plenty accurate, and it has never given us trouble. Our own maintenance men can understand it and take care of it."

Askania Control *is* good control. Only a breath of air touches the web. Yet the control puts out enough force to position the heaviest mill rolls with ease. Control range is limited only by your own equipment.

This is the sensing nozzle that measures the web position. Only a breath of air touches the paper.

See Askania Edge Position Control in action in booths 267-8 at the Packaging Show, Navy Pier, Chicago, April 20-23. You'll see a spectacular demonstration.

Write for Bulletin 141

ASKANIA REGULATOR COMPANY
278 E. Ontario Street, Chicago, Illinois
Subsidiary of General Precision Equipment Corp.

The Paper Industry Safety News

Four Perfect Scores Reported by Southern Safety Association

MEMBER MILLS of the Southern Pulp & Paper Safety Association are steadily decreasing their average injury frequency rate. That rate for the 57 competitors in the 1953 contest was 8.52. This compares to the 9.78 recorded in 1952 and the 10.13 in 1951.

Leading the list of pulp and paper plants was the Mead Corp. at Harriman, Tenn., with a rate of 0.00 in 454,824 man-hours exposure.

The only other perfect scores recorded last year were found in the converting plants and woods operations. The bag plant of Gulf States Paper Corp. at Tuscaloosa, Ala., had no disabling injuries in 1,078,630 man-hours. Two firms achieved perfection in woods operations: St. Regis Paper Co., Pensacola, Fla. (204,080 man-hours), and the Mead Corp., Lynchburg, Va. (4,080 man-hours).

Four mills under 1.00

In addition to the Harriman operation of Mead, three plants competing in the mill division had frequency rates of less than 1.00. These were: Ecusta Paper Div. of Ecusta Paper Corp., Pisgah Forest, N. C., 0.42 (2,347,225 man-hours); Gulf States Paper, Tuscaloosa, 0.55 (3,595,244 man-hours), and Crossett Paper Mills, Crossett, Ark., 0.62 (1,611,839 man-hours).

In the 1952 contest only three pulp and paper mills had rates of less than 1.0. These were Buckeye Cotton Oil Co., Memphis; Ecusta Paper, Pisgah Forest, and Gulf States at Tuscaloosa.

In the converting industries division, the plant of Gulf States Paper at Tuscaloosa was the only operation in the bag plant section with a rate of less than 1.00. The average rate for the 11 competitors in 1953 was 12.12, as contrasted to 8.78 in 1952 and 12.12 in 1951.

International leads box plants

Among box plants in the converting industries division, International Paper Co. at Georgetown, S. C., was the leader. The operation reported one injury in 494,094 man-hours of exposure, for a frequency rate of 2.02. The over-all rate for the six competing box plants was 14.25, up from the 13.96 of 1952 and the 9.39 of 1951.

There were seven firms competing in the woods operations division. St. Regis and Mead, as mentioned above, reported no injuries, to take the lead. St. Joe Paper Co. at Port St. Joe, Fla., was third, with a rate of 9.50 in 420,654 man-hours. The average rate for woods operations was 22.95. In 1952 it was 20.75, and in 1951 it was 49.29.

NSC Honor Award to Ecusta for Outstanding Mill Record

"The greatest total of consecutive, injury-free man-hours in the tissue paper industry known to the National Safety Council" has earned for the Paper Div. of Ecusta Paper Corp. a special NSC Award of Honor.

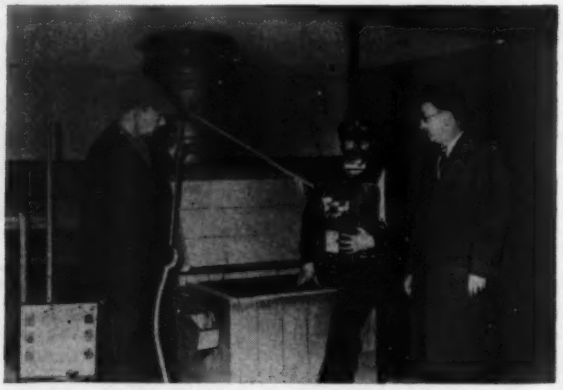
On March 18 the Pisgah Forest, N. C. mill passed its 439th consecutive day with no disabling injury of any kind. The Olin Industries Inc. subsidiary suffered its last injury on January 2, 1953, and has worked 2,811,400 man-hours since that date without a blemish. (Ecusta, a producer of cigarette paper, other tissues and technical specialties, was the winner of the 1953 Edward Benton Fritz Memorial Trophy for the best over-all achievement in 1952. This award, based on the NSC safety contest results, is sponsored by THE PAPER INDUSTRY.)

The record was announced by Walter B. Stovall Jr., senior statistician for the NSC, and is based on the American Standards Association code for judging injuries.

Sonoco Qualifies for Award

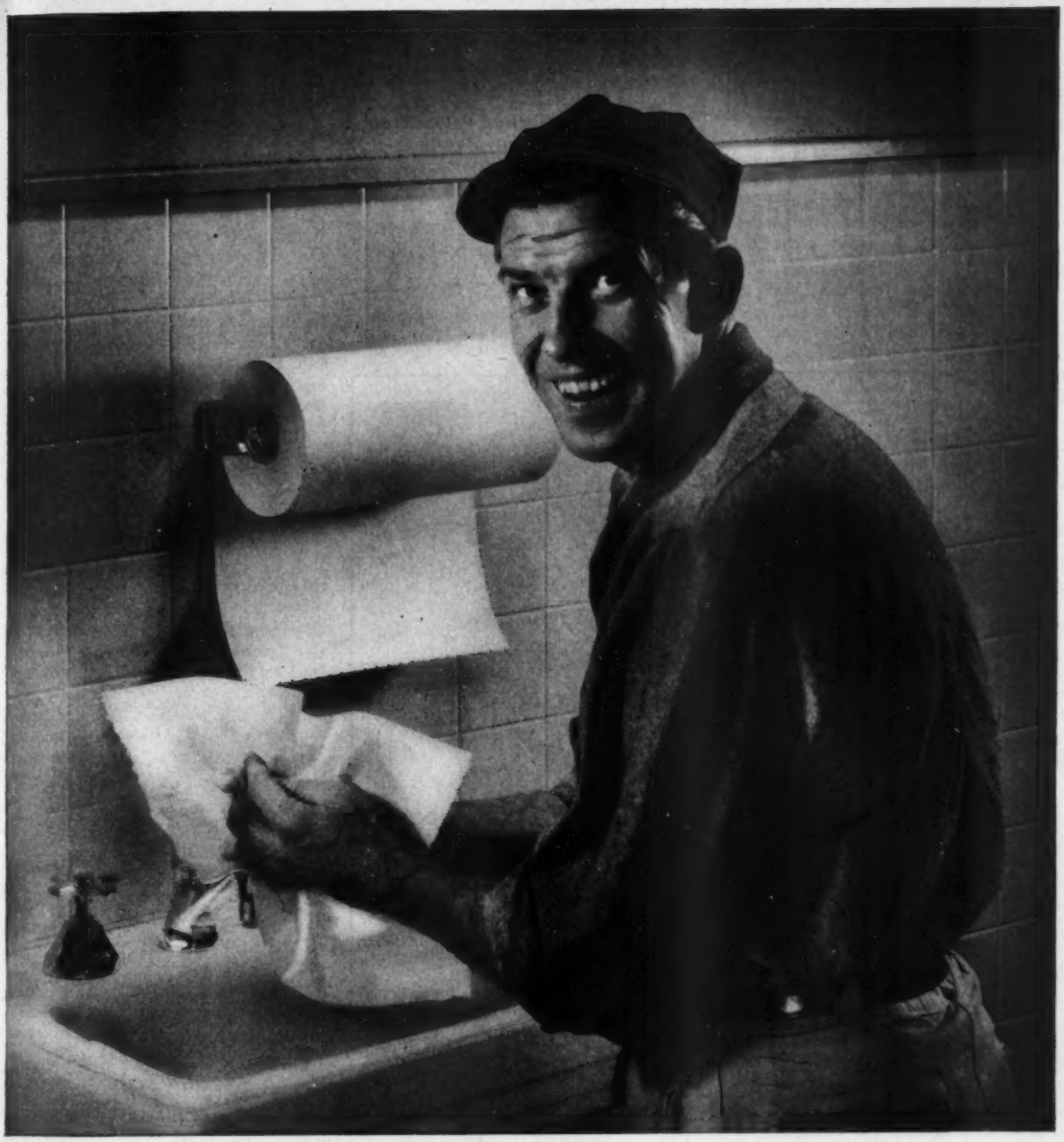
Sonoco Products Co. of Hartsville, S. C., has been notified that it has qualified far a National Safety Council Award of Honor. This announcement was made by C. W. Suggs, safety coordinator for the firm.

Sonoco's award is based on improvement shown in both frequency and severity rates. The firm has recorded an improvement of 69 per cent in frequency and 80 per cent in severity. In his letter of con-



SAFETY METHODS ARE brought to the fore in frequent displays and demonstrations at West Virginia Pulp & Paper Co.'s mill at Mechanicville, N. Y.; the program is under the supervision of Edward A. DeCelle, safety director.

At the left, Mr. DeCelle demonstrates a respirator to a new employee; in the background is the display board of available safety equipment that is placed in the various mill departments at regular intervals; at the right, an employee prepares to enter an empty pulp bleaching tank for inspection while Mr. DeCelle (right) looks on; the inspector is wearing a "Chemox" apparatus that generates its own oxygen and is a development of Mine Safety Appliances Co.



WET-STRENGTH TO SPARE

For any type of paper or board, specify Hercules Kymene® when you want high wet-strength at an economical cost. This wet-strength resin comes ready to use and is available quickly wherever you are located.

Easy to handle, Kymene has excellent stability in dilute solutions and has proven its value wherever used. Your Hercules P.M.C. representative will be glad to discuss this popular cationic urea-formaldehyde resin with you, or write Hercules for technical data.

Paper Makers Chemical Department
HERCULES POWDER COMPANY
INCORPORATED
961 King St., Wilmington 99, Del.

SERVING YOU BETTER · THRU BETTER SERVICE ·

SIZING MATERIALS AND CHEMICALS FOR PAPER

Safety News . . .

gratulations to the South Carolina company, Ned H. Dearborn, NSC president, said, "The Award of Honor is the highest recognition obtainable for an outstanding safety record."

This is the second straight year that Sonoco has qualified for the honor award and in 1952 was one of only 18 companies in the pulp and paper industry to receive it. The firm produces semichemical pulp, boxboard and corrugating material.

80% Rate Reduction Praised at Labor-Management Meeting; Rayonier Wins Trophy

During the past eight years the 23 pulp and paper mills in the State of Washington have reduced their frequency of industrial injuries by more than 80 per cent.

This was reported early in April at the Eighth Annual Labor-Management Safety Conference, where 260 representatives of the industry discussed ways and means of further reducing the accident rate. The meeting was held at the New Washington Hotel in Seattle.

According to A. E. Brown of Portland, vice president of the International Brotherhood of Paper Makers, "In 1946 the injury frequency rate in Washington mills was 35 accidents per 1,000,000 man-hours worked, and at the end of 1953 the rate was 6.9."

(The program of joint safety conferences was inaugurated in 1946 by the Pacific Coast Association of Pulp and Paper Manufacturers, representing the employers, the International Brotherhood of Pulp, Sulphite and Paper Mill Workers, and the International Brotherhod of Paper Makers. Conferences are held each year in Oregon, Washington, and California.)

An improper manner

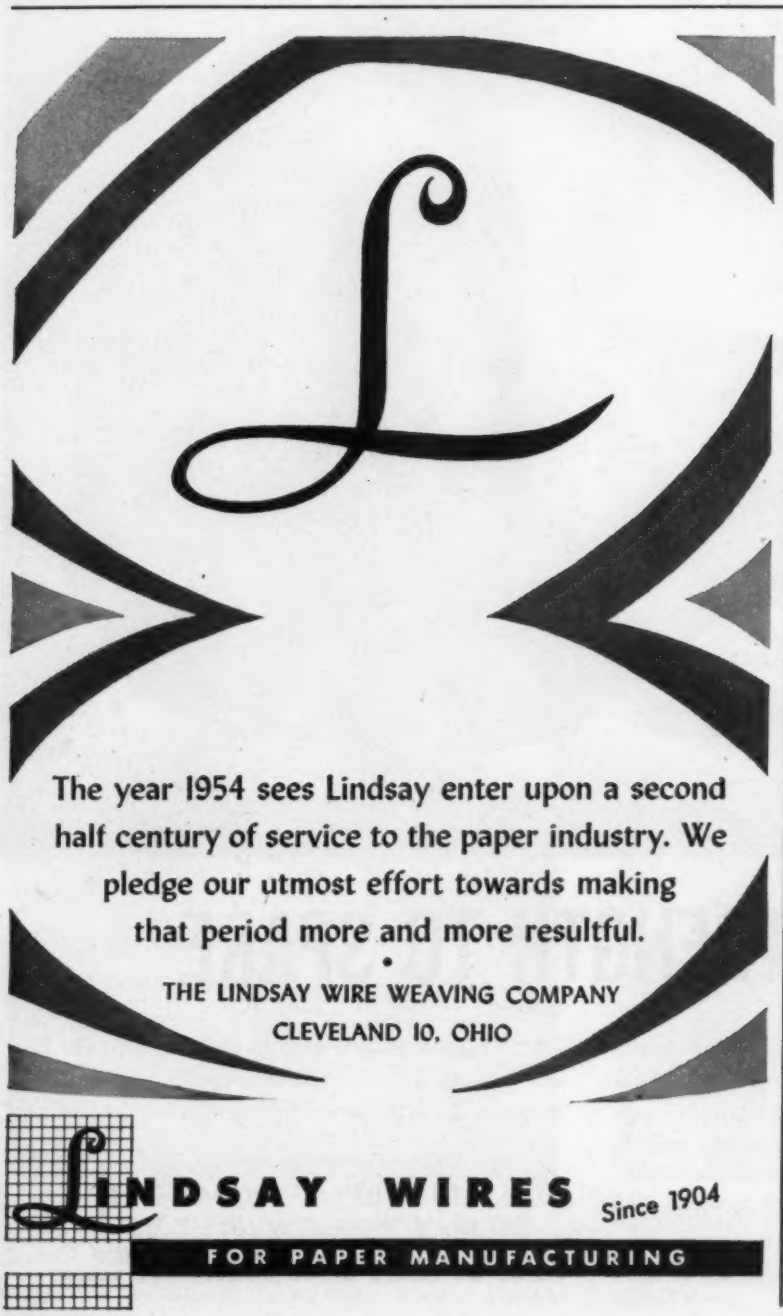
Efforts on the part of management and labor over the past eight years have greatly reduced the traditional causes of accidents. Speaking for management, R. E. Bundy, executive vice president of Fibreboard Products Inc., told the group: "Eight years ago I think the record would show that most of our accidents resulted from exposure to unguarded machinery, poor housekeeping, dangerous scaffolding, etc. Our efforts to date have practically eliminated these things, and we find that today accidents are for the most part the result of doing our jobs in an improper manner due to thoughtlessness. To correct this we must direct our efforts toward creating safety consciousness on the part of everyone in our plants."

The cooperation of labor was promised by W. E. Riggs of the Pulp, Sulphite and Paper Mill Workers: "Representatives of labor, as well as workers in the plants, must regard the safety program as a joint effort in which they have an important part and as a game which everyone can win. In developing a successful safety program we are saving our brothers and sisters from untold pain, suffering and untimely death — as well as protecting their earning power."

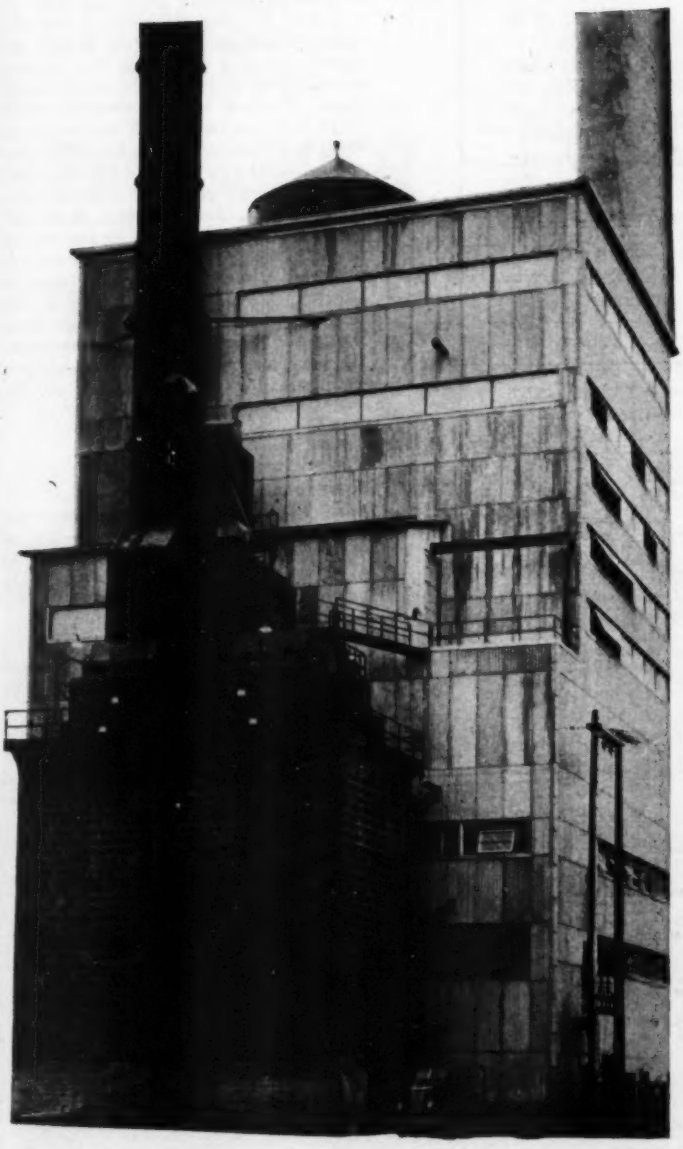
Honors to Rayonier

The Arthur B. Langlie Safety Trophy for the best safety record during 1953 was presented to representatives of the Olympic Div. of Rayonier Inc. at Shelton, Wash. The award was made by Governor Langlie, who commended the industry for its fine record in industrial accident prevention.

The Shelton concern also won awards for having the best accident record over the immediate past five years.


The year 1954 sees Lindsay enter upon a second half century of service to the paper industry. We pledge our utmost effort towards making that period more and more resultful.
THE LINDSAY WIRE WEAVING COMPANY
CLEVELAND 10, OHIO
LINDSAY WIRES
Since 1904
FOR PAPER MANUFACTURING

Million-Pound C-E Recovery Unit begins service at Longview Fibre Company



A major addition to Longview Fibre Company's continuing expansion program — its second C-E Recovery Unit and one of the world's largest—began operation in November 1953.

Housed in a seven-story-high building, the new unit is designed to burn 1,050,000 pounds of black liquor solids per day, and to produce 165,000 pounds of steam per hour at 850 psi and 750 F.

The availability of this new equipment made it possible to effect urgently needed repairs on the stack that served other recovery units of the mill. The new unit was called upon to operate at well above its rated capacity during this period. This it did with complete satisfaction carrying the load of five of the six paper machines.

In reordering C-E recovery equipment the Longview Fibre Company but adds its name to the growing list of companies which have done so. So far, fourteen leading pulp and paper manufacturers have ordered a C-E Recovery Unit at least twice, two of them on three occasions and three companies have ordered four times. This record, we believe, speaks for itself. B-730

COMBUSTION ENGINEERING, Inc.

Combustion Engineering Building, 200 Madison Avenue, New York 16, N. Y.

BOILERS, FUEL BURNING & RELATED EQUIPMENT; PULVERIZERS, AIR SEPARATORS & FLASH DRYING SYSTEMS; PRESSURE VESSELS; AUTOMATIC WATER HEATERS; SOIL PIPE

The Paper Industry Patent Reviews

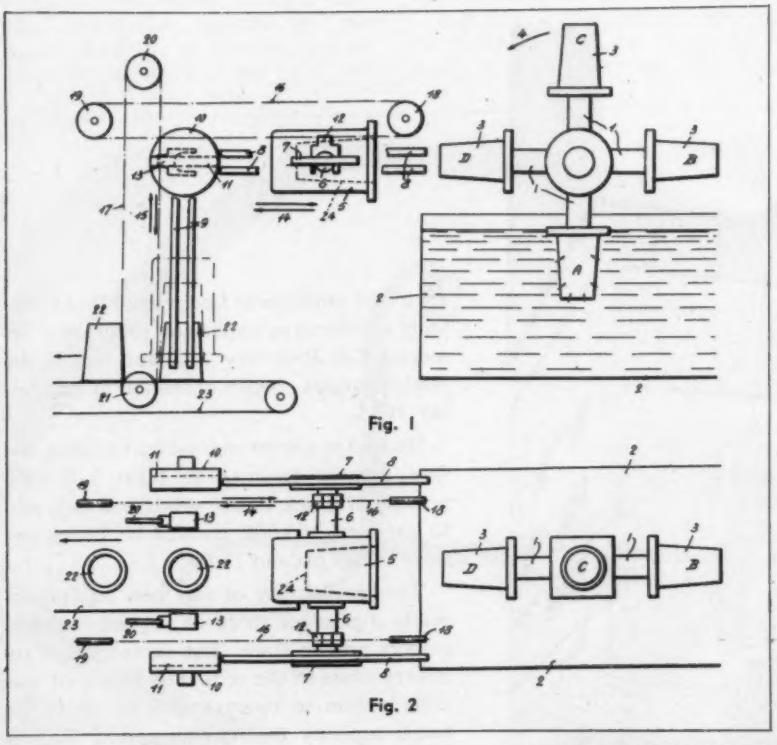


Fig. 1

Fig. 2

MELVIN NORD*

Apparatus for Automatic Withdrawing of Pulp Articles from Molds

The pieces or rough shapes obtained from pulp sucked up on to a mold and then dried by suction present problems of withdrawal from molds that are difficult to solve on account of their weakness owing to their moist condition. A standard solution of this problem consists in using a counter-mold that is held over the dried rough shape by setting up a slight pressure in the mold or a lowering of pressure at the end of the counter-mold, so that the rough shape works loose from the mold without getting out of shape and remains in the counter-mold. But this method suffers from its high net cost and the serious dangers of change of shape that result in a high percentage of rejects.

In U.S. 2,663,230, issued Dec. 22, 1953, Jean Wagner, an automatic apparatus is provided for removing the rough shapes from the mold and leading them without manual handling to the drying equipment. The apparatus is shown in Figs. 1 and 2, the former being an elevation and the latter a plan view.

The molding appliance is made up of the wheel 1 located above the tank 2, each arm being furnished with a perforated type mold A,B,C, or D. Means (not shown) are provided for applying suction or pressure to the molds. The operations take place in the following order: Mold A, suction of the pulp against the mold. Mold B or C, drying by suction. Mold D, withdrawal from the mold by stopping the suction, and applying slight pressure if necessary, to loosen the rough shape 3.

A box 5 is furnished with a counter-mold 24, and with means (not shown) for slightly lowering or raising the pressure to be applied to the surface of the rough shape. The box is first moved by chain 16 so as to cap the mold D and the rough shape 3. There is then a stoppage of the suction in D and then a slight increase in pressure in D or a slight suction in the counter-mold. The chain then draws the box and counter-mold back to the turning plate 10, where it is turned to a vertical position. A slight increase of pressure in the box 5 causes the dumping of the rough shape to 22, on the conveyor leading to the drying equipment. Meanwhile, the box goes back to take up its position in front of the molding apparatus and the cycle starts all over again.

Fourdrinier Wire with Reinforced Coated Edges

In U. S. 2,659,958, issued Nov. 24, 1953, to Henry Johnson, the edges of the fourdrinier wire are reinforced by the application of a plastic reinforcing material which completely covers the warp and weft strands and fills the intervening meshes.

As shown in Figs. 3 and 4, the fourdrinier wire (5) has its side edges rein-

(*continued on page* 208)

*Patent Attorney, 664 Putnam, Detroit, Mich.

Other Patents of Interest to the Paper Industry

Subject	*Inventor or Assignee*	*Patent No.*	*Date*
Drying apparatus for paper	William Messinger	2,661,545	12/8/53
Drier drum for paper	The Black-Clawson Co.	2,661,546	"
Pulp storage tank current control	Western Electric Co. Inc.	2,661,668	"
Ultrasonic gage for web thickness	General Precision Laboratory Inc.	2,661,714	"
Package cushioning and sealing means	Paper Patents Co.	2,661,835	"
Paper coffee cup	Delbert E. Phinney	2,661,889	"
Box construction	Lanzit Corrugated Box Co.	2,661,890	"
Carton	Edmund V. Arranga and Anthony J. Malley	2,661,891	"
Paper bag and handle	Crown Zellerbach Corp.	2,661,892	"
Preparation of straw-cellulose suitable for manufacture of high-grade paper	American Enka Corp.	2,662,012	"
Mildew-resistant mineral-coated paper soap wrapper	S. D. Warren Co.	2,662,040	"
Forming roll for making Insulite board	Minnesota & Ontario Paper Co.	2,662,451	12/15/53
Machine for making printed, corrugated box blanks	Melvin H. Sidebotham	2,662,452	"
Multicell collapsible carton	The Bradley & Gilbert Co.	2,662,682	"
Collapsible partitioned carton	Sutherland Paper Co.	2,662,683	"
Carton structure	Add-A-Handle Corp.	2,662,684	"
Apparatus for cooking fiber material by the "dry" process	The Celotex Corp.	2,662,821	"
Process for treating tall oil	Armour & Co.	2,662,849	"
Pulp beater or disintegrator	Ralph J. Serpas	2,663,228	12/22/53
Defibrator	American Defibrator Inc.	2,663,405	"
Container with carrying handle	Container Corp. of America	2,663,485	"
Bottle tray	Wilbro Corp.	2,663,486	"
Expansible carton and detachable cover	Richard E. Paige	2,663,487	"
Corner locking device for containers	Gaylord Container Corp.	2,663,488	"
Corrugated carton	Bernard Etra and Irving Etra	2,663,490	"
Corrugated stiff board case	The Lawrence Paper Co.	2,663,491	"

To keep oil flowing at correct temperature

De Laval Mill Lubrication Systems are

...ROSS

EXCHANGER

EQUIPPED!

Completely self-contained, all piped up and ready to operate, this De Laval Mill Lubrication System is equipped to furnish bearings with the proper amount of lubricant at required pressure.

To keep oil flowing at correct temperature and viscosity, a Ross Type CP Exchanger is furnished as a standard component. Safe, dependable cooling is always assured!

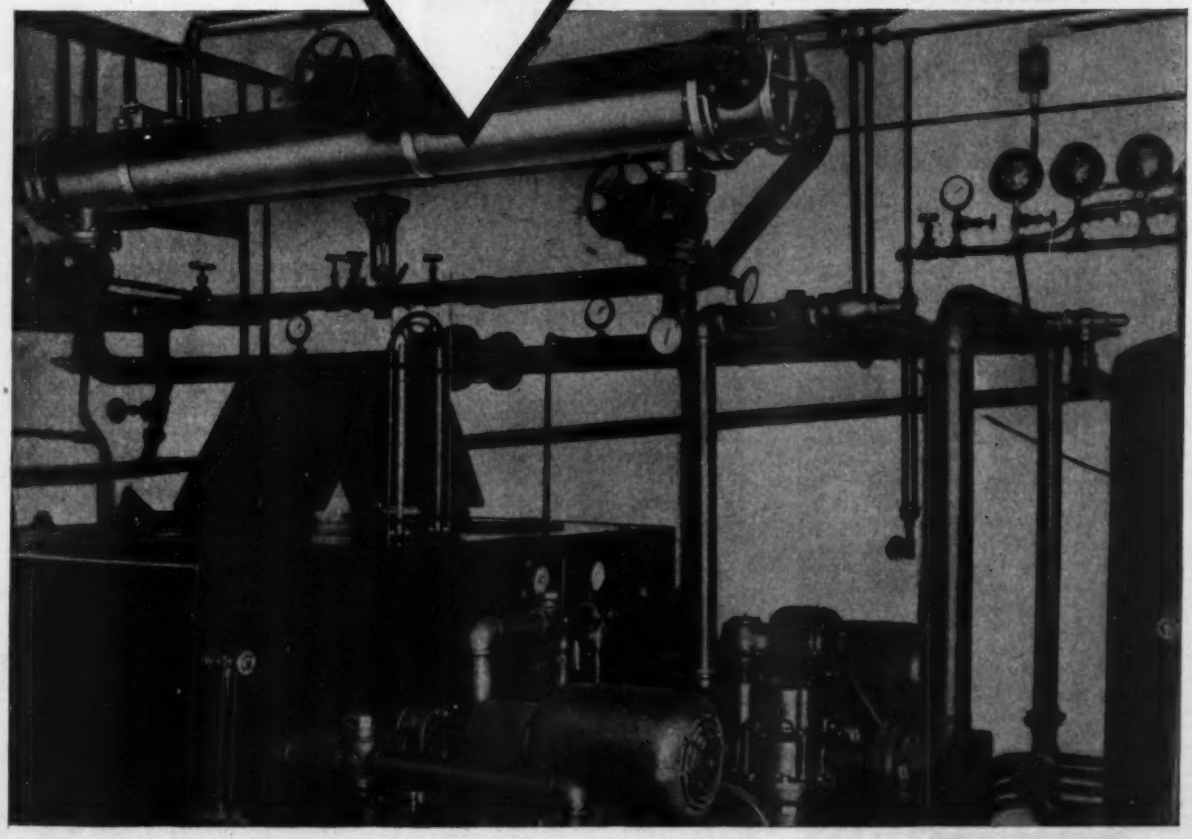
"Compact in design, relatively light in weight, easily installed and reliable, Ross Exchangers have a well-established reputation for long life and minimum maintenance," states the De Laval Separator Company.

Teamed with De Laval Lubrication Systems in paper, steel and rubber mills, Ross Exchangers are likewise teamed with *numerous* types and makes of prime equipment at work *throughout* industry . . . to cool lube oil, jacket water and hydraulic fluid.

Make sure *your* organization is fully familiar with pre-engineered, fully standardized Ross Exchangers. Bulletin 2.1K1 will be mailed promptly on request. Write.

KEWANEE-ROSS CORPORATION
DIVISION OF AMERICAN RADIATOR & STANDARD SANITARY CORPORATION
1430 WEST AVENUE • BUFFALO 13, N. Y.
In Canada: Kewanee-Ross of Canada Limited, Toronto 5, Ont.

ROSS



Serving home and industry: AMERICAN-STANDARD • AMERICAN BLOWER • CHURCH SEATS & WALL TILE • DETROIT CONTROLS • KEWANEE BOILERS • ROSS EXCHANGERS • SUNBEAM AIR CONDITIONERS

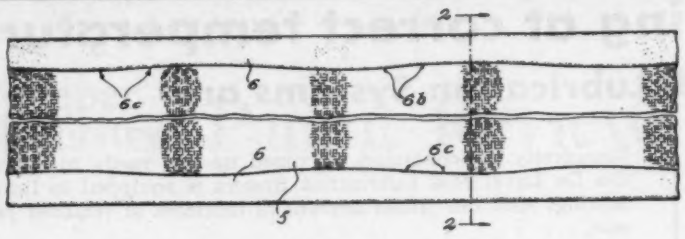
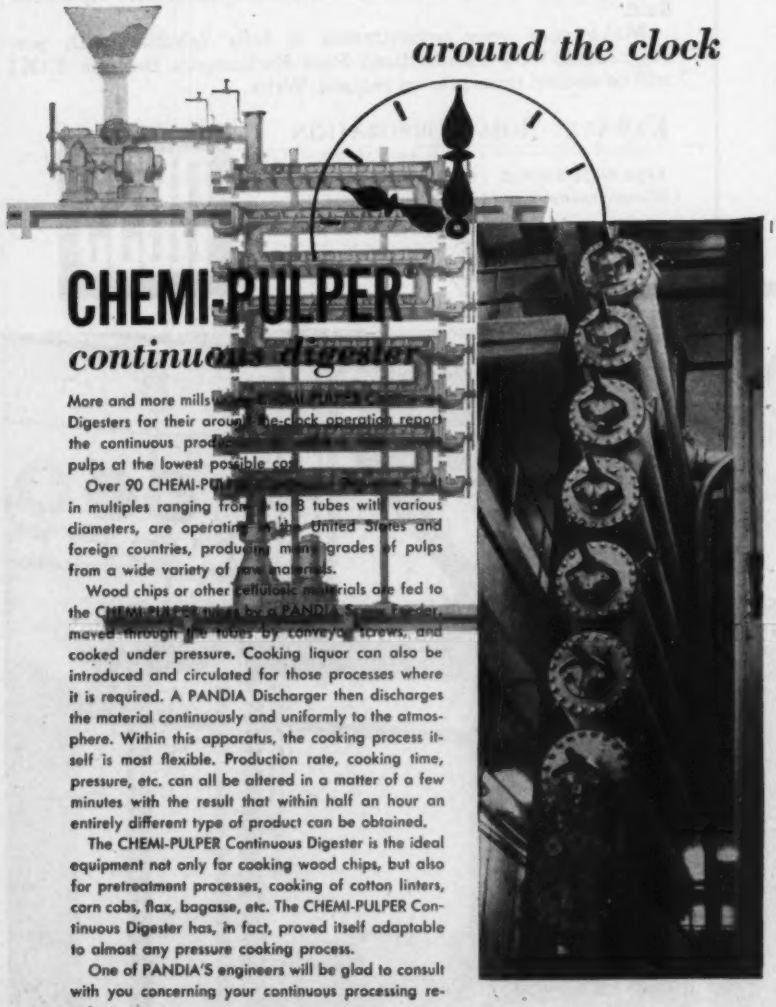


Fig. 3

Fig. 4



More and more mills [illegible] CHEMI-PULPER Continuous Digesters for their around-the-clock operation report the continuous production of superior pulps at the lowest possible cost.

Over 90 CHEMI-PULPER Continuous Digesters in multiples ranging from 2 to 8 tubes with various diameters, are operating in the United States and foreign countries, producing many grades of pulps from a wide variety of raw materials.

Wood chips or other cellulosic materials are fed to the CHEMI-PULPER intake by a PANDIA Screw Feeder, moved through the tubes by conveying screws, and cooked under pressure. Cooking liquor can also be introduced and circulated for those processes where it is required. A PANDIA Discharger then discharges the material continuously and uniformly to the atmosphere. Within this apparatus, the cooking process itself is most flexible. Production rate, cooking time, pressure, etc. can all be altered in a matter of a few minutes with the result that within half an hour an entirely different type of product can be obtained.

The CHEMI-PULPER Continuous Digester is the ideal equipment not only for cooking wood chips, but also for pretreatment processes, cooking of cotton linters, corn cobs, flax, bagasse, etc. The CHEMI-PULPER Continuous Digester has, in fact, proved itself adaptable to almost any pressure cooking process.

One of PANDIA'S engineers will be glad to consult with you concerning your continuous processing requirements.

Write for Bulletin C3.

Manufactured and Sold in Canada by
THE ALEXANDER FLECK LIMITED, OTTAWA, CANADA.

PANDIA

PANDIA INC.
122 EAST 42nd STREET • NEW YORK 17, N. Y.

(*continued from page* 206)

forced by plastic material (6). Each edge of the fourdrinier wire may be reinforced by applying a single preformed covering strip of plastic material and subjecting the wire and the covering plastic strip to heat and pressure. Alternately, the fourdrinier wire may be reinforced by sandwiching it between two strips of plastic material and subjecting to heat and pressure. In some cases it has been found that when the plastic reinforcing material is applied so that it presents straight inner edges, there is a tendency for the wire to develop cracks adjacent to and extending in the longitudinal direction of the inner edges of the reinforcing material. This difficulty can be overcome by using plastic reinforcing strips having a scalloped edge (6b) and applying the strips so that the scalloped edges face toward the inner longitudinal center of the wire. It is preferred that the scalloped edges be contoured so as to present long sweeping reverse curves (6c).

Machine for Pulping Paper Stock

U. S. 2,658,426, issued Nov. 10, 1953, to Edwin Cowles and assigned to The Cowles Co., relates to a machine for pulping paper stock. A machine is provided having a tank of large capacity in which a relatively small impeller may be employed. The impeller and tank are so constructed and arranged as to make it possible for a small impeller to create and maintain adequate circulation of all portions of the stock in the tank and adequate submerging action, without the necessity of maintaining vertical circulation of all portions of it. Such impellers, because of their relatively small diameter not only operate at higher efficiency, but also make possible the use of smaller, lighter, cheaper gear-reducing units, and in many cases make possible the use of a simple V-belt drive at a cost less than that of a gear-reducing unit.

Apparatus for Screening and Pulping Papermaking Stock

U.S. 2,661,664, issued Dec. 8, 1953 to Joseph Baxter Jr and assigned to The Black-Clawson Co., provides an apparatus which both pulps and screens papermaking stock in a scingle pass, and delivers the reject material in relatively dry condition for ready handling and disposal. The unit requires simple piping connections and relatively little floor space for its capacity.

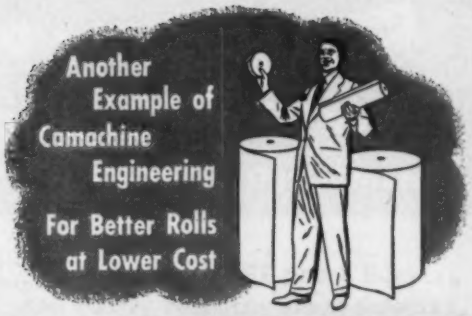
Papermaking Machines

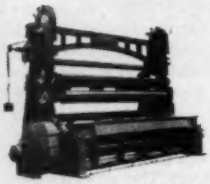
In a series of three new patents, issued Dec. 8, 1953, William V. Knoll provides several types of machine for use in papermaking.

U.S. 2,661,665 describes an improved beater roll mechanism that is made up of several interchangeable sections, which can be removed and replaced as they become worn. U.S. 2,661,666 describes an apparatus for pulping and screening papermaking stock. In U.S. 2,661,667, pulp is refined by progressively increasing its fineness as it passes through a series of identical units.

Hydraulic RIDING ROLL LIFT

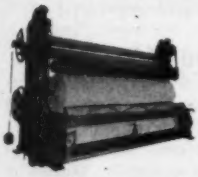
Smooth-acting, balanced control with no manual effort. Hydraulic cushioning prevents shock at the maximum upward-travel point of the piston and assures impact-free contact between riding roll and rewind shaft at the start of winding. Automatic operation reduces down-time between sets.





CAMACHINE TYPE 20

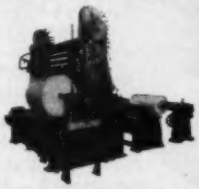
Widths to 310". Maximum rewind capacity may be either 42", 60" or 72" dia. Speeds up to 5,000 fpm* on paper and paperboard.



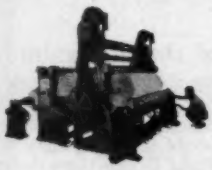
CAMACHINE TYPE 19

Widths to 192". Maximum rewind capacity may be either 42", 60" or 72" dia. Speeds up to 3,500 fpm* on paper and paperboard.

CAMACHINE TYPE 18



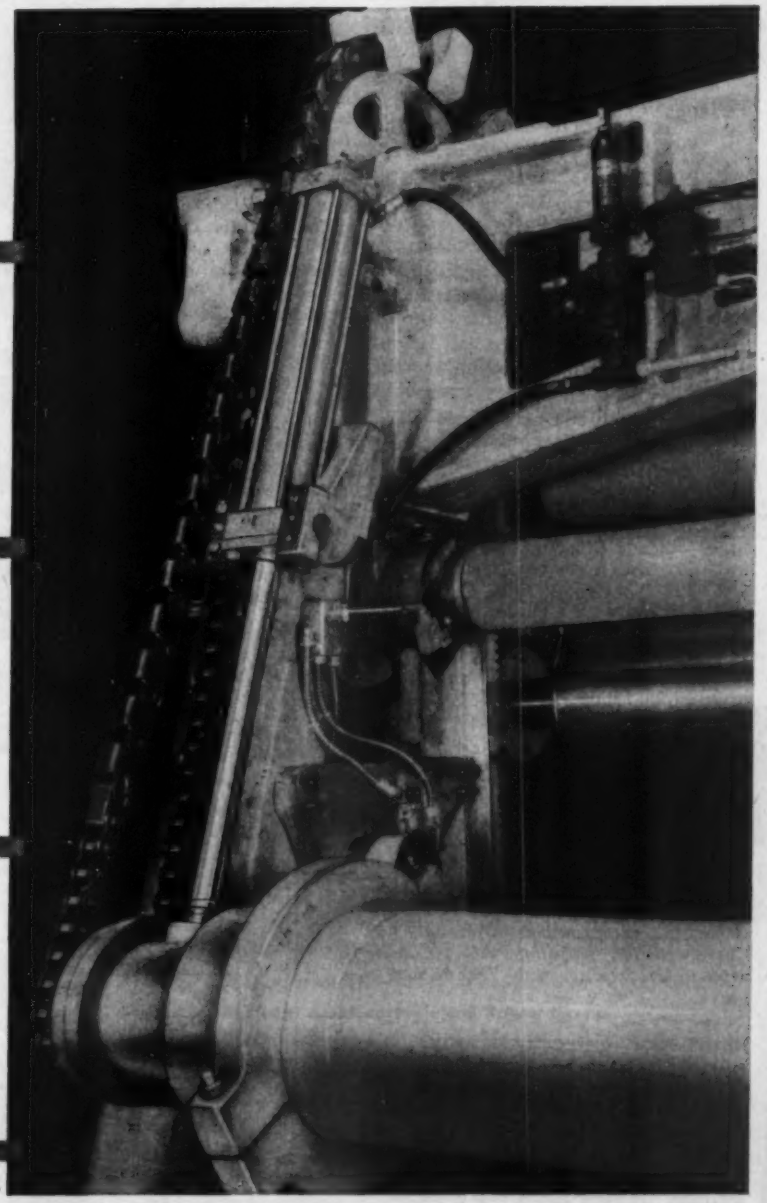
Widths to 150". Maximum rewind capacity may be either 42", 60" or 72" dia. Speeds up to 2,500 fpm* on paper and paperboard.



CAMACHINE TYPE 14

Widths to 92". Maximum rewind capacity may be either 38", 50" or 60" dia. Speeds up to 1,800 fpm* on paper and paperboard.

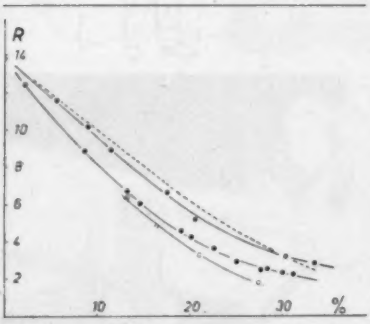
*Speeds depend upon characteristics of material and machine width.



Don't wind up with less than a Camachine®

Cameron Machine Company • 61 Poplar Street • Brooklyn 1, N. Y.

The Paper Industry Foreign Abstracts



N-alkanolamider: ○ etanolformamid; ● metanolformamid; ● metanolacetamid, and ⊙ dietanolformamid

Nitrogen-containing softening agents

The effectiveness of various alkanol- and alkyl amine salts, N-alkanolamides, and ammonium salts as possible softening agents for paper is investigated. Paper samples are impregnated with aqueous solutions of the chemicals and then dried, without stress, in air. Stiffness (Rigidity = R) is measured by the Clark technique (Tappi Standard T 451 m. 45).

Of the substances studied, N-alkanolamides and certain alkanolamine hydrochlorides prove to be very good softeners. This is shown in the case of amides, in the accompanying figure. Here N-alkalolamider = N-alkylolamides; etanolformamid = 2-formamidoethanol; metanolformamid = formamidomethanol; metanolacetamid = acetamidomethanol, and dietanolformamid = $HCON(CH_2CH_2CH)_2$.

Certain changes in the properties of the paper after softening are noted; e.g., mechanical behavior and water content. The stiffness of the sheet appears to be independent of the manner in which the agent is applied or the method of drying. J. Kubat., *Svensk Papperstidn.*, 56, 739-744 (1953) (in Swedish, with English summary).

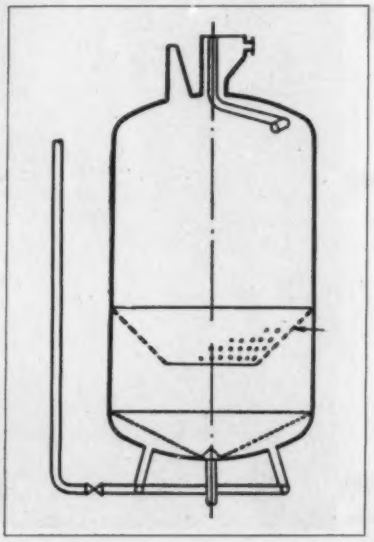
Heartwood extractives may cause digester corrosion

The author's researches (carried out in the Vancouver Laboratory of the Forest Products Division of the Department of Resources and Development of Canada) show that certain organic compounds which are metal chelating agents can participate in the corrosion of carbon steel digesters. Some of these occur as extractives in Western pulpwoods or are generated during the cooking operation.

For example, in a search for the cause of accelerated digester corrosion in the Kraft pulping of western red cedar, it is found that two types of chelating agents are responsible for corrosion. The tropolones, "thujaplicins," form metal chelate complexes, *but only in the absence of alkali*. Hence, corrosion from this source is confined only to steaming or filling operations. However, another phenolic fraction forms a complex with iron which is very stable to alkali and can cause solution of iron under conditions of alkaline pulping. Catechol and its derivatives are very corrosive to steel during the alkaline cook. Taxifolin, a catechol derivative, which occurs in Douglas fir heartwood is also a corrosive agent. The significance of these results are discussed in some detail.

Aging cedar (sawdust) for 3 months caused a marked lowering of the corrosive action of the wood. Stainless steel (in contrast to drawn mild steel, A.S.T.M. 285-C steel, and 201-B steel) is very resistant to the action of the chelating extractives.

Because of the widespread occurrence of catechol derivatives, pulp mill operators are warned to conduct corrosion as well as pulping tests in deciding whether or not to use unbarked wood or unexplored species. Seventeen references, three tables, seven structural formulas, and one figure, Harold MacLean and J.A.F. Gardner. *Pulp and Paper Mag. Canada*, Nov. 1953, 125-130.



Washing unbleached kraft pulp

After discussing the methods used in Canada and in the United States, the author describes a new method for diffuser washing developed in the mill in which he is engineer, in Oulu, Finland. Diffusers that have conical and intermediate perforated bottoms which prevent the stock from forming a compact layer against the screen plates (see accompanying figure) during the washing process are used. The rate of flow of the wash water should be kept constant, and there are limits to the speed at which the washing operation can be carried out. The flow rate is regulated by means of flow-meters and regulating valves in each diffuser. The new diffuser technique increased the production capacity of the mill by 55-60 per cent, using diffusers 4.9 m. in diameter and 8.9 m. in height. L. Hannunkari. *Paper and Timber*, 35, No. 6, 251-258 (1953). (Original in Finnish, with an English summary.)

Alkaline pulping of beechwood

Assuming that in an alkaline delignification 16 per cent alkali is consumed and that ¾ of this (i.e., 12 per cent) is used up by the hemicelluloses, the authors find that only 3 per cent is actually utilized in *dissolving* the hemicelluloses. About 9 per cent (well over half of the total alkali consumption) is used in neutralizing acids formed during the cook — *from* the hemicelluloses.

This waste of alkali may be prevented by a two-stage process, in which the hemicelluloses are first removed by an alkaline pretreatment *below 100° C.*, followed by an alkaline digestion above 140°C. However, in such a process the alkali-lignin found in the black liquors is only about one-half of that found in the usual commercial cook. Hence, the authors assume that in the commercial cooking operation a part of this "lignin" actually emanates from the hemicelluloses. V. Prey, E. Waldmann, and W. Krzandalsky. *Holzforschung*, 7, 117-122 (1953) (in German).

Permanence of chemical pulps

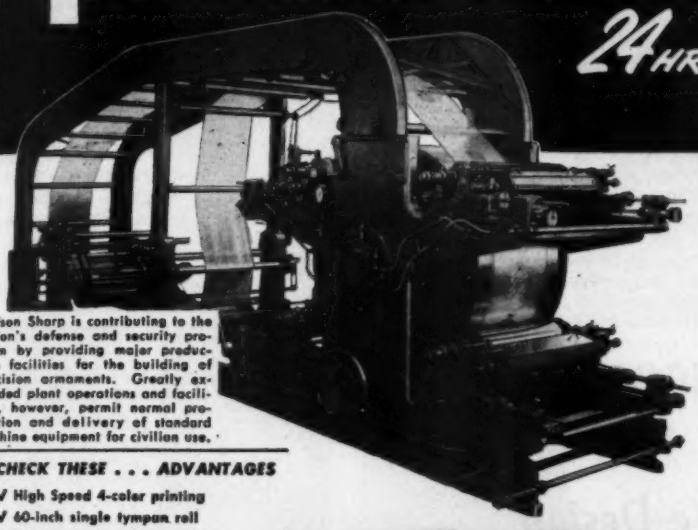
The permanence (durability) of 24 pulps of very different origins are judged by applying methods of artificial ageing, followed by a study of certain changes in pulp properties. Pulps include those made from rags, cotton linters, bleached sulfite, bleached and unbleached kraft, and straws. In all cases, the initial alpha-cellulose contents and fluidities are also determined.

The pulps, beaten to about 50° Schopper-Riegler, are formed into sheets and aged for various time periods—two and three weeks at 100°C., and one and two weeks at 120°C. After conditioning at 20° and 65 per cent relative humidity, the sheets are then tested for folding endurance, and these figures are compared with this same property prior to artificial ageing.

Losses in folding endurance are noted in

FLEXOGRAPHIC PRINTING with COLOR CONTROL

24 HR. CONTINUOUS REGISTER WITHOUT ADJUSTMENT!



Hudson Sharp is contributing to the nation's defense and security program by providing major production facilities for the building of precision armaments. Greatly expanded plant operations and facilities, however, permit normal production and delivery of standard machine equipment for civilian use.

CHECK THESE . . . ADVANTAGES

- ✓ High Speed 4-color printing
- ✓ 60-inch single tympan roll
- ✓ Constant, one setting register
- ✓ Perfect tension web control
- ✓ Low range surface drying
- ✓ Continuous operating splash-proof ink fountains
- ✓ Automatic color throw-outs
- ✓ Prints 20" to 50", repeats up to 36"
- ✓ Continuous smooth drive operation
- ✓ Heavy duty arc-type frame
- ✓ Overhead lead for easy accessibility, better drying and handling.

HUDSON-SHARP
MACHINE CO • GREEN BAY • WIS
Manufacturers of
Printers, Embossers, Folders, Interfolders, Waxers, Laminators, Wrapping Machines, Core Winders, Packaging Presses, Crepers and Napkins, Toilet Tissue and Paper Towel Units.

A-4 ARC TYPE press licks costly register slow-downs . . . material breakage stoppages

Manufacturers, converters and commercial printers keep production moving with this modern press. Designed especially for accurate, continuous hair-line register on polyethylene, vinyls, plastic films, foils, cellophane and thin papers — where exceptional stretch and expansion is prevalent. Construction embodies single 60" diameter impression cylinder around which is mounted one to four color stations. In operation, web locks around cylinder to provide nearly *foolproof* register. Specially designed hydraulic web control maintains constant tension unwind and rewind throughout printing and drying. Write for complete details.

---

use **"VEE GRIP" STOCK-PIPE FLANGE**

QUICK ASSEMBLY • PERFECT ALIGNMENT • LOW COST • • EASIER CLEANOUTS

Can be adapted to any standard tubing size with minor change in O.D. of face ring.

OVERLY'S, INC. Box 263 NEENAH, WISCONSIN

DISTRIBUTED BY

FABRI-VALVE COMPANY OF AMERICA
PORTLAND 12, OREGON
FELKER BROS. - MARSHFIELD, WISCONSIN
WISCONSIN WIRE WORKS EQUIPMENT CORP. - APPLETON, WISCONSIN

BE WIS-WISE use

PERFECT SURFACE WIRES FOR PERFECT PERFORMANCE

Expertly made with finest precision equipment from extra select wire. Backed by years and years of experience is your assurance of the very best.

WISCONSIN WIRE WORKS
APPLETON, WISCONSIN
© 1953

COMPLETE ENGINEERING AND CONSTRUCTION SERVICES FOR THE PULP AND PAPER INDUSTRY

If you have a problem involving any of the following, you can get immediate and experienced help from EBASCO engineers and consultants:

- Design and Construction of Pulp and Paper Mills
- Steam and Hydro-Electric Power Plants
- Power Studies
- Reports and Appraisals
- Recovery Plants, Extensions and Alterations

For complete details on EBASCO's various services send for "The Inside Story of Outside Help." Address Dept. 10, Two Rector Street, New York 6, N. Y.

ENGINEERS • CONSTRUCTORS • BUSINESS CONSULTANTS
EBASCO

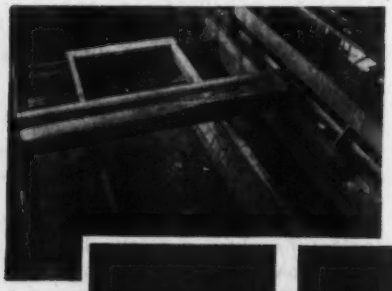
EBASCO SERVICES
INCORPORATED
NEW YORK • CHICAGO • WASHINGTON, D. C.

all cases and the losses are tabulated. The results are somewhat scattered and not always very consistent; however, they show certain trends. Thus, pulp from cotton linters shows the greatest apparent permanence, although admittedly the original folding endurance is much lower than that of some of the wood pulps. Certain of the latter show as great a stability as do the pulps made from rag stock. This is particularly true of certain kraft pulps, especially those bleached with chlorine dioxide (which are more permanent than those bleached with hypochlorite).

Long heating, especially at 120°, usually causes very serious losses in mechanical strength. The durability is also judged by loss in brightness (yellowing). These too are tabulated.

From each of these tests, the authors have sought to arrange the pulps in order of their permanence, and whereas the two orders are not identical, the trends are similar; and there exists a certain relationship between yellowing and loss in fold. Even within the same pulp type there are very marked variations in permanence (judged by the two tests). No general statement can be made that pulps of one kind are necessarily more durable than those of a different origin. The properties often overlap. Even in the case of yellowing, some bleached kraft pulps show a high degree of stability.

The study originates in the T.N.O. Institute for investigation of fibers, textiles and paper, in Delft, Holland. G.van Nederveen and A.H.H.van Royen. *Papeterie*, 75, 797-808 (1953) (in French).



We Design, Build and Repair

TILE

Structures

The smallest repair job receives careful attention . . .

The largest construction job handled with highest efficiency

All work – design, engineering, erection, maintenance – is performed by industry-famous teams of Stebbins specialists. All work is guaranteed. Stebbins service available on quick notice anywhere in North America.

Write for FREE copy of Bulletin A-153

SEMCO

STEBBINS

Engineering and Manufacturing Company, Watertown, N. Y.

STEBBINS ENGINEERING CORP. – TEXTILE TOWER, SEATTLE, WASH.

CANADIAN STEBBINS ENGR. & MFG. CO., LTD. – CASTLE BLDG., MONTREAL, CANADA

SINCE 1884

Specialists in Design, Installation and Servicing of Linings and Tile Tanks

Tree breeding in Finland

A couple of selected plus tree pines

With the establishment of the Foundation for Forest Tree Breeding in 1947, methodical work in this field has progressed satisfactorily. Experimental activities are centralized at the Ruotsinkylä station (25 kilometers from Helsinki) and at Punkaharju (300 kilometers northeast of Helsinki).

Initially, the so-called "plus trees" are chosen from excellent stands because they are of good quality and of rapid growth. The selection is very rigorous; and, to date, 500 Scots pines, 200 spruces, 100 birches, 100 larches and about 100 other trees have been chosen.

Top branches of these plus trees are collected for grafting, and this graft is made on seedling 2-4 years old. Over 25,000 such grafts have been made, and about 70 per cent have been successful. Most of these grafts are being used in establishing seed orchards, which are stands raised exclusively for the production of forest tree seed. A brief description of such orchards is given. Most of them are in southern Finland. The seeds furnish means of establishing forests of high genetic standards.

Besides the seed orchard work, research is fostered in the field of crossing experiments. For example, *Populus tremula* has been crossed with *P. tremuloides*, and birch crosses and larch crosses have been made. The general aim of tree breeding is to obtain higher yields and better quality. Anonymous. *Finnish Paper and Timber*, 4, No. 6, 73-74 (1953). (In English.)

Fatty acids of pinewood and tall oil

After reviewing the literature on the extractives of Scots pine (*Pinus sylvestris*) and on tall oil, the author tests the method of the American Oil Chemists Society, as well as the so-called "cold saponification method" on the fatty acids, with a view toward determining their conjugating effects. Reliance is placed chiefly on ultraviolet absorption spectrophotometry. Whereas both methods result in small amounts of conjugated dienoic absorption, the cold saponification method yields practically no trienoic absorption and its use is recommended.

Freshly prepared polyene acids (of the type found in pine extractives) can be stored for two weeks at −12°C or lower

LOOK AT THE RECORD
Of DeZurik Plug Valves!

FOR OVER 28 YEARS, DeZurik has built the one line of valves expressly engineered for paper-making services. In almost every pulp-and-paper mill in the industry, DeZurik Valves are proving over and over every day that they are the industry's specialized valves to best meet the industry's special needs.

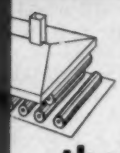
LOOK AT THE FEATURES
Of DeZurik Plug Valves!

EXCLUSIVELY, DeZurik Easy-Operating Valves have the rubber-faced eccentric plug that opens full and closes t-i-g-h-t with a quarter-turn. They don't bind, won't score, don't clog . . . and they require no lubrication, reseating or adjustment. Literature or demonstration on request.

DeZURIK SHOWER COMPANY
SARTELL, MINNESOTA

NEWCOMB-DETROIT

PIONEERS IN INDUSTRIAL VENTILATION



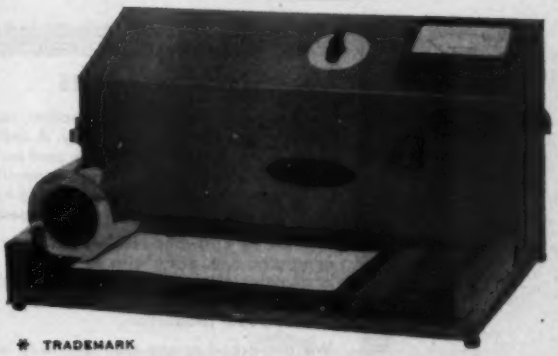
HEAT & AIR SYSTEMS
that cut cost and increase production in
PAPER MILLS

ESTABLISHED 1912
- DETROIT DIVISION
- GRAND RAPIDS DIVISION
- NEWCOMB INDUSTRIES, LTD., WINDSOR DIVISION

For Bulletins and Quotations, Write
NEWCOMB-DETROIT
5763 Russell St.
Detroit 11, Mich.

PAPER MANUFACTURERS AND PRINTERS RECOMMEND THE

Vanceometer*
Oil Absorption Tester



* TRADEMARK

- TO OBTAIN A NUMERICAL RATING OF ABSORPTION INTO PAPER AND PAPER BOARD.
- TO TEST PLAIN OR COLORED STOCK.
- TO GET SURE RESULTS QUICKLY

HILLSIDE LABORATORY
25 HOWARD AVENUE — HILLSIDE, ILLINOIS

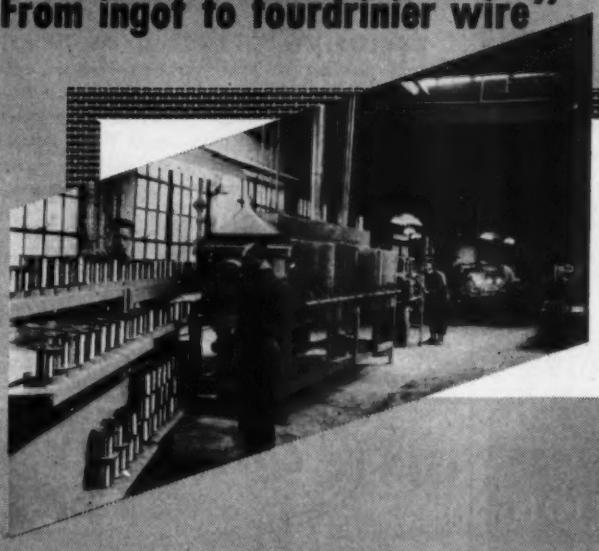
without changes in spectral character. At room temperature, however, changes begin within 2 days. The usual type of fatty and resin acids in pine decrease markedly on storage of wood; auto-oxidation results in the formation of conjugation in the pinewood fatty acids. The extractives insoluble in petroleum ether, when heated to 180°, liberate small amounts of conjugated acids.

A study is also made of the effects of the kraft cook on various unsaturated acids. In such experiments, about 38 per cent of the linoleic acid and 50 per cent of the linolenic acid are changed. The author finds that in Finnish tall oil either linolenic acid is lacking or that its content is very low.

In making iodine number determination, the author advocates the Klee-Benham (rather than the Wijs) technique. From his spectral examinations, it is believed that the fatty acids in Scots pine include an acid with four conjugated double bonds, which, in the cook, is converted into a triene system (simulating linolenic acid). Presumably diene systems are also formed. In normal tall oil, palmitic acid appears to be a secondary product. Any difference between the acid number and the saponification number may be ascribed to re-esterification.

Methods for showing contamination of fatty acid with other components are discussed. Paavo Kajanne, Institute Technology, Helsinki, Finland. *Paper and Timber* (Finland), 36, 1-10 (1954) (original in Finnish, with English summary). See also *Acta Chem. Scand*, 4, 1147 (1950) and *Annales Academiae Scientiarum Fennicae* A II, 50, both of which give some of these data in English.

"From ingot to fourdrinier wire"



ANNEALING THE WIRES

Just as one alloy differs from another, so do their individual requirements for annealling vary. A definite ratio of speed and temperature must be used for each type. Skilled employees, tending our modern annealling furnaces, adhere faithfully to the proper speed-heat formulae so that your Eastwood wire will have the longest possible life.

Because the Eastwood-Nealley plant is a *completely integrated* one, every wire we ship has undergone thorough and continual analysis, control and testing from the raw metals to your finished fourdrinier wire ready for quality paper production.

We are proud to say they are *truly ours*—"from ingot to fourdrinier wire".

EASTWOOD-NEALLEY CORPORATION
Belleville, N. J.

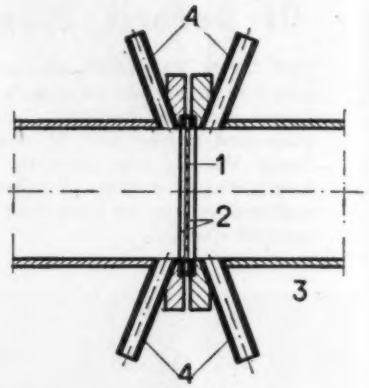


Fig. 1

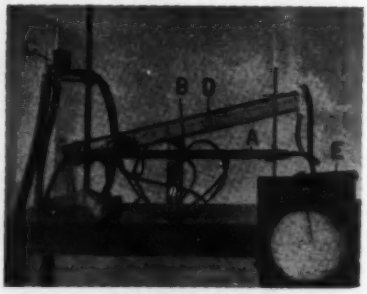


Fig. 2

Resistance of paper machine wire to hydraulic flow

Resistance to the flow of water by different specimens of paper machine wire is measured at low pressure differentials. As shown in Fig. 1, the wire sample (1) is placed between two flanges (2) in a horizontal brass pipe (3) 5 cm. in diameter. The pressure differential is adjusted by means of constant level overflow boxes and measured by means of an inclined differential manometer with taps (4) close to either side of the wire.

A half tone of the equipment is shown in Fig. 2 in which A is the tube holding the wire sample B. Water flow is regulated through C; D is the manometer, and the automatic recording device is E.

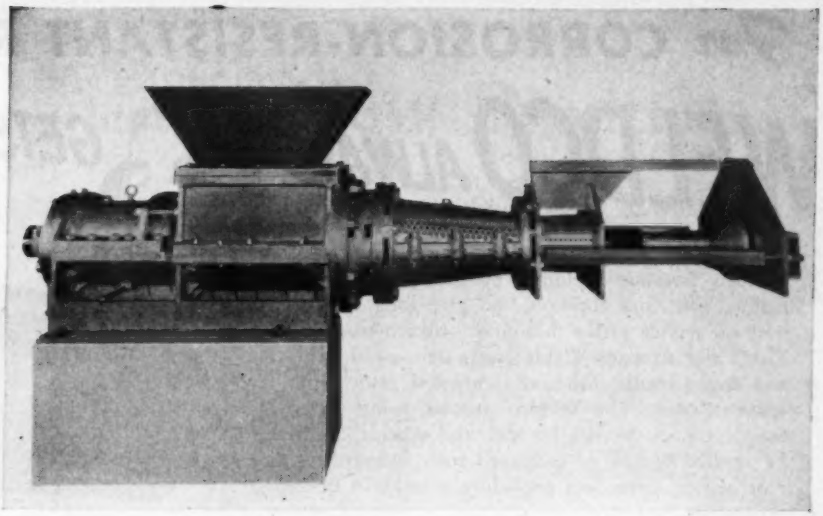
The resistance is expressed as the pressure differential

$$\Delta h = \frac{30 \cdot Q}{F^2} + \frac{13\ (mn)^{0.5} \cdot 10^{-4}\ Q^2}{F},$$

where Q is the flow, F the open area of the wire (expressed in percentage of the total wire area) and where m and n are the number of wire threads respectively in the machine direction and cross-machine direction.

Three methods for determining E are described (*ie*, by (a) actual calculation, (b) by a projection technique, and (c) by means of photoelectric method). Of these, method (c) appears to be the simplest and most satisfactory. The authors give three figures, nine graphs, three tables

BARK PRESS



The Defibrator Bark Press for continuous dewatering of wet bark is made of highest quality stainless and steel castings. Operating data below taken from presses now in regular operation in pulp mills.

Capacity: 110 Tons/24 hrs., Bone-dry basis
Water Content of Dewatered Bark: 52—55%
Power Consumption: 45 h.p.

AMERICAN DEFIBRATOR, INC. CHRYSLER BUILDING NEW YORK 17, N.Y. West Coast: A. H. Lundberg Orpheum Building, Seattle, Wash.

DON'T GUESS! TEST R.P.M. AND F.P.M. IN YOUR PLANT

They are the keys to production. Avoid loss of production due to slow speeds and feeds, or excessive wear because of abnormal high speeds by checking them with STICHT portable or permanently mounted Tachometers.

STICHT UNIVERSAL HAND TACHOMETERS

Centrifugal type, combine five ranges in one instrument such as No. 303; 30-12,000 RPM, No. 322; 60-24,000 RPM, No. 346; 120-48,000 RPM. Many others, Bulletin No. 1046.

HERMAN H. STICHT CO., INC.
Tachometer Headquarters
27 PARK PLACE NEW YORK 7, N. Y.

STARCHES DEXTRINES GUMS LYCOID®

Laboratory control assures uniform quality

STEIN HALL
285 MADISON AVENUE NEW YORK 17, N. Y.

ESTABLISHED 1866

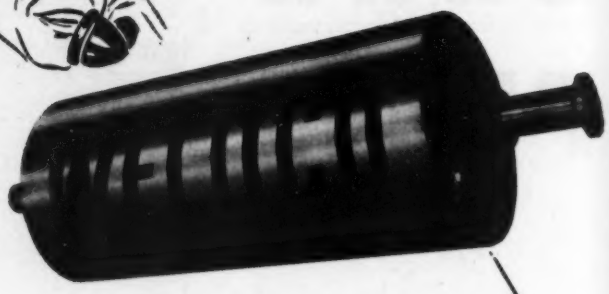
Atlanta, Boston, Charlotte, Chicago, Cincinnati, Detroit, Los Angeles, New Orleans, Philadelphia, Portland, Providence, Rochester, San Francisco, St. Louis, Toronto, Montreal

For CORROSION-RESISTANT ROLL COVERS

WELDCO ALWAYS GETS FIRST CALL!

Both new and old rolls, covered by the patented Weldco "Pressure Welding" process, resist corrosion, withstand abrasion, and give long, economical service with a minimum of maintenance. That's why so many Weldco rolls are used in pulp and paper, textile, food, and chemical plants from coast to coast. The Weldco process, using Monel, Stainless Steel, Nickel, Inconel, and other alloys, can be applied to new or reclaimed rolls, eliminating the cost of new cores and providing substantial operating economies.

Investigate this patented process that's not an electroplate ... not a sprayed coating ... but a solid layer of rolled metal, applied to the base roll uniformly and tightly. Let Weldco's roll specialists advise you on the best materials for your roll and processing requirements.



Other WELDCO Products Include: Alloy Pipe and Tubing, and Fabricated Piping

THE YOUNGSTOWN WELDING & ENGINEERING COMPANY

3700 OAKWOOD AVENUE . . . . YOUNGSTOWN 9, OHIO

and three references. J. Bergström and H. Knell. *Svensk Papperstidn.*, 57, 1-8 (1954) (original in German, with brief English summary).

Foam formation in sulfite spent liquors

A study is made of the volume and the stability of foams from various spent liquors. All of these foams are three phase systems. In two cases, the ether extract (and its sulfur and methoxyl content), the per cent of fibers and fiber fragments, and the ash (and the mineral components) are determined. The ether extract contains about 50 per cent acids and 12-15 per cent unsaponifiable matter. Stable foams contain surface active agents and appreciable amounts of fibers that are rich in extractives.

From the ether extract of a beechwood spent liquor is isolated a lignin-like material that proves surface active and contains 23-24 per cent methoxyl. This apparently has a marked influence on foam formation. The volume of the foam increases with the concentration of the liquor. In the acid range (up to about pH 5), this volume is relatively low, but it increases rapidly with rising pH. This is especially true in spruce sulfite spent liquors.

In beechwood spent liquor, the maximum volume of the foam is obtained when the fiber content is low (up to about 0.5 g. per l.), and above this point the volume drops. Foam stability of beechwood spent liquor greatly increases when the liquor has been aged. In fresh beechwood spent liquor, the greatest stability is reached when the fiber content is 4.4 g. per l.; with a liquor eight days old, the maximum is reached when the fiber content is 2.8 g. per l. and the stability is actually 4 times that of the fresh beechwood spent liquor.

The highest stability is shown by liquors diluted with 30 to 100 parts of water. The lowest stability is noted at pH 7, increasing very rapidly, however, both in the alkaline and in the acid ranges. Neither the stability nor the volume is much affected by temperature changes between 0 and 25°. As the rosin size addition to beechwood spent liquor increases, the foam volume increases very slightly, but the stability of the foam drops sharply.

The authors discuss the possible mechanism of foam formation. One table, five figures and 12 footnote references are given. Theodor Kleinert and Marietta Ruck-Floriantschitsch. *Das Papier*, 8, 13-17 (1954) (in German).

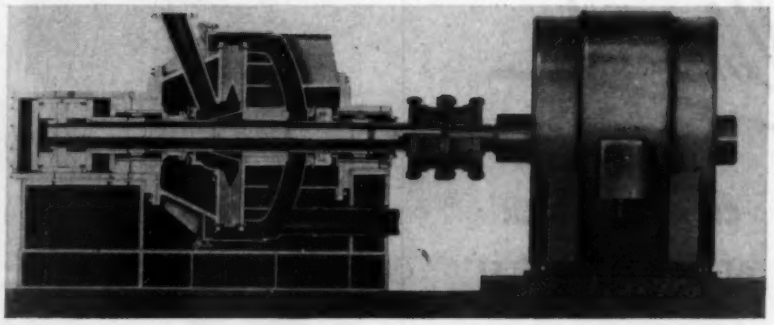
Copolymer of butadiene and acrylonitrile as a beater additive

The Royal Institute of Technology in Stockholm recently developed a method for producing synthetic rubber by the copolymerization of butadiene and acrylonitrile This material (I) can be made from Swedish raw materials, but at present their prices are higher than are those of the wet strength resins.

In cooperation with the Swedish Forest Products Research Laboratory, experiments are made with a view towards introducing a latex (from I) as an additive to produce wet-strength papers. A (negatively charged) emulsion of I is used and added to unbleached kraft pulp beaten to 20° Schopper-Riegler, which is then heated at about 200°C for 8-16 minutes. Under these conditions, both dry and wet strength numbers increase. The wet strength is given as 100 x wet tensile strength for I-impregnated, heated paper/dry tensile strength of untreated, unheated paper. When not heated, I reduces the dry strength of the paper, which, however, is considerably higher when the sheet is heated, although there is a minimum reached between 0.5 and 1.0 per cent I, after which the strength curve rises rapidly. With heat treatment the wet strength of the sheet increases as a logarithmic function of the I-content. As an example, with 8 per cent I, the wet strength is shown to be 57 per cent. On the other hand, the "fatigue index" (logarithm of the folding endurance number) decreases with increasing I content, even after heat.

The influence of impregnation with I, followed by heat treatment, on the water absorption is also studied. Heat treatment causes a marked decrease in water sorption, presumably due to the lowered swelling rates of the hemicelluloses. A paper with relatively low strength properties is made from a stock containing 80 per cent mechanical and 20 per cent unbleached sulfate pulp. Using 2 per cent of I and curing the sheet eight minutes at 200° gives a paper with a wet strength of 75 per cent and a dry strength of 165 per cent; however, the sheet has a low folding endurance. The latter can conceivably be improved by the addition of suitable softeners. Karl-Georg Larsson and Gösta Thurne. *Svensk Papperstidn.*, 57, 73-77 (1954) (in English).

The Paper Industry New Products



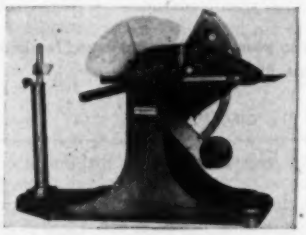
Refiner

A new refiner, known as No. 440, is fourteenth in the Bauer line of revolving disc mills which range in size from 2 to 800 hp. It is designed especially for stock preparation service and incorporates several radical departures from conventional disc mill design, especially in that it is intended to be fed and discharged under pressure.

The refiner has a rotating 44 in. disc driven through coupling by any standard slow speed motor (usually 400 to 514 rpm) in the range of 450 to 750 hp. The frame is of welded steel construction. Both the stationary and rotating discs are fabricated to achieve rigidity without excessive weight. All parts of the refiner in contact with stock are of stainless steel.

Unlike the ordinary types of "free-discharge" disc mills, which have proved very effective qualitywise and in power consumption, the No. 440 "pump-through" refiner is said to lend itself very well to continuous refining and in-series operation—without intermediate chests and with only one pumping. (The pressure on the discharge side of the disc exceeds the inlet pressure.) The machine can be operated in series with other No. 440's; or, in connection with jordans, it can precede or follow the jordans. If desired, it can discharge a measured flow directly to a regulating box.

According to the manufacturers, the new refiner combines the virtues of the "free discharge" disc mills with the installation convenience of the jordan, plus a flexibility not available in either. *Bauer Bros. Co., 1759 Sheridan Ave., Springfield, Ohio.*



Puncture tester

The recently introduced TMI-Beach puncture tester is based on an original design by the General Electric Co. and conforms to A.S.T.M. standard D781-44T.

The manufacturer claims that the instrument is a simple and reliable instrument which can be used by anyone without special attention or manipulation. Corrugated board, vulcanized fiber, wallboard, fiberboard, plywood, heavy liner, etc., can be tested accurately and rapidly by factory personnel or lab technicians. There is a range for corrugated and fiberboard up to 0.140 in. Height of the instrument is 2½ ft., and net weight is 250 lb. *Testing Machines, Inc., 123 W. 64th St., New York 23, N. Y.*

Lubricants

Two new additions have been made to the Tri-State line of lubricating greases and oils.

No. T/S-21 multi-purpose ball and roller bearing grease replaces nearly all special lubricants. It has no melting point and will not break down or bleed, even at very high temperatures, according to the manufacturer. It can be pumped at temperatures below 0° F. This new grease is said to be completely water resistant, with a higher degree of adhesion to metal surfaces than most other greases; and it is chemically neutral.

Since some industries require a high temperature grease which has no odor or taste, or which will not stain fabrics, a version of T/S-21 multi-purpose, designated as No. T/S-21 S, has been developed. *Tri-State Petroleum Co., 81st & Eastwick Ave., Philadelphia 42, Pa.*

Synthetic high-melting point waxes

SynPar waxes, produced in Germany by Krupp Kohlechemie G.m.b.H., using the Fischer-Tropsch process, are now being sold in this country. The SynPars are high molecular weight aliphatic hydrocarbons; part of the molecules are branched with short side chains. They are characterized especially by their high melting points, hardness, fine crystal structure, and purity. Since these waxes are prepared from simple chemical starting materials—carbon monoxide and hydrogen—their purity is constant; and they contain no foreign materials, according to the manufacturer.

SynPar can be used in the pure form

WILLIAMS PRECISION FREENESS TESTER

A Freeness Tester Based on Timed Drainage

The only type of instrument that will give accurate freeness tests thruout the entire range from the freest to the slowest.

No Other Instrument Has Its Versatility

1. **Test Pad instantly removable for dry weight check and consistency.**
2. **Makes hand sheets for color, sizing and dirt comparisons — shives.**
3. **The only Freeness Tester that can be equipped with Recording Attachment for research work or permanent records.**
4. **Behavior of stock may be observed thru graduated glass cylinder during test and measured at any intermediate point.**

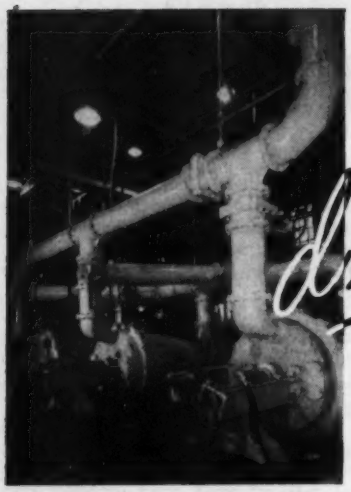
Not New . . . . . Proved By Experience

More than 350 Williams Precision Freeness Testers in use in over 150 paper mills and research laboratories.

WILLIAMS APPARATUS CO., Inc.

75 Park Place **Watertown, N. Y.**

Pulp Testing Ovens
Sheet Moulds
Sheet Dryers
Paper Moisture Testers
A.S.T.M. Penetration Testers
Smoothness Testers
Laboratory Presses
Electric Centrifuges
Wood Chip Classifiers



mpc WOOD-LINED STEEL PIPE

delivers

CLEANER STOCK AT LOWER COSTS!

MPC Wood-Lined Steel Pipe, especially designed to solve the piping problems of the paper industry, offers greater carrying capacity and maximum corrosion resistance at important savings in installation, pumping and maintenance costs. Its light weight makes it easy to install.

Let dependable, efficient and economical MPC Wood-Lined Steel Pipe answer your problems of corrosion, abrasion, frictional resistance or sliming. Specify MPC Wood-Lined Steel Pipe, the pipe that combines the strength of steel with the durability of wood!

Piping and fittings are available in standard sizes or to your special requirements. For additional information, write Applications Engineering Dept. PI.

MICHIGAN PIPE COMPANY / Bay City, Michigan

or as an additive to modify the properties of less expensive waxes. It is recommended for all uses requiring high melting points and hardness, such as paper coating, carbon paper, and waterproofing. Descriptive literature and samples are available. *H. L. Barnebey Chemical Processes, P. O. Box 144, Pittsburgh 30, Pa.*

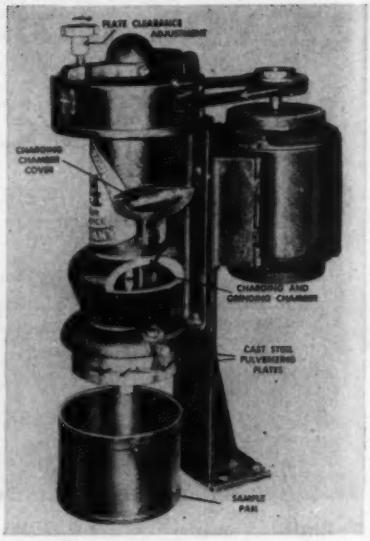
Pilot-operated steam reducing valve

Designated as No. 933, a new pilot-operated steam reducing valve meets the needs of most steam reducing valve installations; pressure adjustments are easily made.

Although extremely sensitive, its simple operation insures trouble-free service, according to the manufacturer. Downstream pressure is sensed by the diaphragm of the pilot valve. The pilot uses upstream pressure to open the main valve if downstream pressure is too low; if too high, it bleeds off the pressure, allowing the main valve to close as required. The action is accomplished without appreciable variation in downstream pressure as correction is made almost instantaneously when the pilot valve senses any slight change in controlled pressure.

The valve is manufactured in sizes from ¾ to 6 in. Sizes below 2 in. have bronze bodies; larger sizes are semi-steel.

The manufacturer states that the large balanced diaphragm provides positive main valve action without hesitation, wide pressure variations or sticking. *Klipfel Valves, Inc., Hamilton, Ohio.*



Laboratory sample pulverizer

A new laboratory sample pulverizer is now on the market. It consists of a vertical assembly with horizontal grinding plates. All gears have been eliminated with V-belt drive. The unit is easily cleaned and is dust-free. According to the manufacturer, unusually long life of cast alloy steel plates has been reported. Simple adjustment sets plates for producing samples to pass 80 mesh, 100 mesh, or 200 mesh.

The base is drilled for 3/8 in. bolts or lag screws and can be mounted quickly and easily on table or bench. The pulverizer weighs 55 lb. and is of rigid construction, 26 in. high, 9 in. wide and 22 in. deep. A ½ hp totally-enclosed motor of standard manufacture furnishes power for normal 900 rpm pulverizer speed. *Denver Equipment Co., P. O. Box 5268, Denver, Colo.*

Squirrel cage induction motors

A complete new line of Allis-Chalmers ac squirrel cage induction motors in frame sizes 326 and smaller is now available. The new design of frame sizes up to and including 326 follows the newly established NEMA standards, which mark the first major change in frame reassignment for these sizes in 25 years.

The new motors (designated Type G)

proven by performance

The Sutherland Refiner complete continuous Beating and Refining Systems.*

SUTHERLAND REFINER CORPORATION

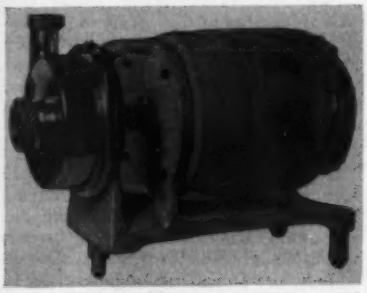
TRENTON 8, NEW JERSEY

*U. S. Patent No. 2,654,295

retain all the important features of Allis-Chalmers "AP" line while offering certain improvements inherent in the redesign. The efficiency and power factors of the new motors may change slightly from the values obtained in present designs. However, the product of efficiency and power factor remains relatively the same, according to the manufacturers.

The new motors are very similar to present designs. In the new open motor (Type G) the intake openings in the end shields have far greater protection than in the old design. Located in the bottom half of the end shield, these openings are high enough above the base to minimize the probability of the incoming air sweeping dust or lint from the floor or base. All continuous rated totally-enclosed motors under the new A-C design (Type GZ and Type GZZ), even the smallest integral horsepower sizes, are fan-cooled.

According to company officials, the new motors are available in frame sizes 182 and 184. Larger frame sizes will become available at approximately five month intervals. *Allis-Chalmers Mfg. Co., Milwaukee 1, Wis.*

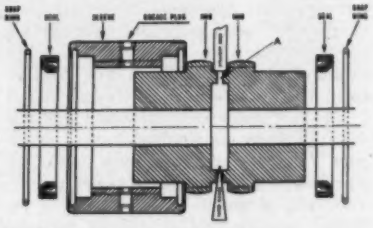


Centrifugal pumps

A complete line of Tri-Clover corrosion-resistant sanitary and industrial centrifugal pumps is now being offered. These pumps have fast, non-clogging centrifugal action with special seals for practically every requirement. They are available in a complete range of sizes and capacities up to 1250 gal. per minute and to 250 ft. of head at zero gal. per minute.

Features of these pumps are patented screw-type impellers with sanitary impeller clips, inert carbon seals which are easily removed for cleaning, streamline lightweight heads with a minimum of parts, and the exclusive Tri-Clamp casing construction.

The "Pump King" unimount series (illustrated) is designed for operation at 1800 and 3600 rpm, and especially where high speeds are required, through heaters, coolers, filters, clarifiers, etc. *Tri-Clover Machine Co., Kenosha, Wis.*



Flexible gear coupling

A flexible gear coupling featuring unusual compactness, ease of installation and durability is now available. Simplicity and compactness are attained through seven-part construction. Resultant savings in time and labor are considerable, according to the manufacturer. Another result is less strain on connected equipment through lower moment of inertia. The couplings average 3/5 the size and 1/2 the weight of flange-and-bolt type couplings.

The coupling absorbs misalignment (both angular and offset) through a rocking action of the hubs in the sleeve. End-float is absorbed by the hubs sliding in the sleeve.

Made of forged high carbon steel, the coupling has internal teeth running the full working length. Instead of the usual bolts, a one-piece steel sleeve transmits the load. Since the coupling has no nuts or bolts, it is claimed that equipment can be disconnected in seconds, using only a screw driver. Connecting is accomplished by hand.

Snugly fitting Neoprene seals keep oil from leaking out and dirt from entering. Each seal is reinforced with a snap ring and has sufficient resiliency to maintain constant closure against slight depressions and unevenness of the shaft surfaces, according to the manufacturer. The coupling will withstand 50,000 lb. of end thrust.

The coupling is available in the following standard types: standard, vertical, mill motor, spacer and floating shaft. Standard sizes are 7/8 to 6, hp 4 to 600 per 100 rpm. Special types and sizes are available on request. Of particular interest to the paper industry are the standard type, and special types: jordan and sliding hub. The jordan type compensates for adjustment of the jordan machine. The sleeve of the sliding hub type is designed to absorb a predetermined amount of sliding action of one or both hubs. *Sier-Bath Gear & Pump Co., Inc., North Bergen, N. J.*

Polyvinyl adhesive

A new synthetic polyvinyl adhesive for use in the wood-utilization industry can be successively frozen and thawed out at room temperature without any loss of strength or working properties. This is an important development since vinyl adhesives are usually ruined by freezing and other adhesives lose up to 75 per cent of their strength. The new resin is known by the trade name Wood-lok R3026. *National Starch Products, Inc.,* 270 *Madison Ave., New York* 16, *N. Y.*

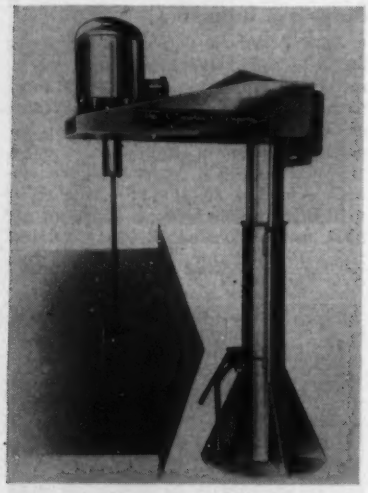
Magnetic pressure pump

A difficult and expensive maintenance problem in the paper industry—the elimination of recurrent damage to pumps caused by bailing wire and other forms of tramp iron in the white water lines—has been overcome by the use of the magnetic pressure hump, according to the manufacturer.

Designed to operate in pressures up to 45 psi, the hump deflects the flow of material 30°, directly across the faces of two Eriez Giant magnets. Any tramp iron present in the material is plucked out by the penetrating action of the powerful Alnico V metal magnetic elements and

held fast until removed by operators in routine periodic cleaning.

Being non-electric, the pressure hump requires no wiring, may be quickly installed and requires virtually no maintenance, it is claimed. The process of magnetic screening afforded is continuous, automatic and permanent; the magnetic efficiency of the unit is guaranteed for the mechanical life of the equipment in which it is installed, according to the manufacturer. *Eriez Manufacturing Co., Erie, Pa.*



Dissolver with three hydraulic lifts

The Cowles Ultrafast dissolver is now available with three different types of hydraulic lifting equipment. It can be purchased with water, air, or oil lifts to raise the patented impeller and bridge clear of mixing tanks. Use of the hydraulic lift makes it possible to process several different materials with the same machine.

Standard hydraulic equipment on the dissolver is the water lift. With sufficient water pressure it is not necessary to use auxiliary pumps to raise and lower the hydraulic ram. For manufacturers who do not have an available water supply with an operating pressure of 35 to 60 psi, two alternative systems on the hydraulically operated dissolvers are available.

The two alternatives are compressed air operating over oil and an auxiliary pump that operates a direct oil hydraulic lift. The compressed air system operates over oil in order to smooth operation. Due to the high compressibility of air, more efficient operation is achieved through the use of an oil buffer. *Cowles Co., Inc., Cayuga, N. Y.*

Electronic measuring instrument

A new electronic measuring instrument, in many cases 100 times faster and more consistently accurate than conventional galvanometers for making bridge-type measurements, according to the manufacturer, has recently been developed.

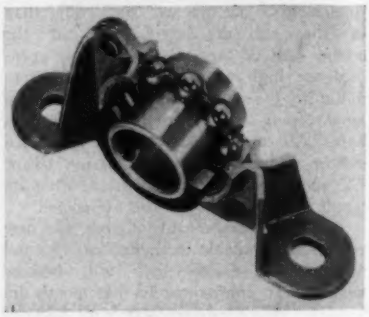
The new instrument, called an ElectroniK Null Indicator, is the first radical departure from the conventionally used galvanometers. Housed in a portable, compact case, it speeds up resistance and potential measurement by utilizing precision potentiometers and bridges. To operate the indicator it is only necessary to close the switch and balance the bridge. The balance point is indicated by the return of the indicator pointer to zero. By contrast, light-beam galvanometers will lose time while waiting for the pointer to cease oscillating, or come back on scale. In addition, it is claimed that the new instrument is not affected by vibration, nor is it necessary to level the indicator since its operation is unaffected by position. It is also claimed that overloads of several hundred per cent will not affect the new instrument.

The input terminals on the instrument can be used with either pin, spade, or banana jacks. The instruments can be used with the case and one side of the input circuit grounded or with the case grounded and the input circuit floating above the ground. An accessible screw driver sensitivity adjustment is provided. *Minneapolis-Honeywell Regulator Co., Industrial Div., Wayne & Windrim Aves., Philadelphia 44, Pa.*

Plasticizing polyol

The narrow humectant range and the hygroscopic and non-crystallizing properties of a newly-developed polyol indicate its usefulness in conditioning of a range of products, including cellulose and paper products. Called G-2401, the product is an 85 per cent aqueous solution of technical hydroxypropyl sorbitol.

Hydroxypropyl sorbitol has a narrow humectant range; it gains and loses water at a much slower rate than most other polyols with changes in atmospheric humidity. Furthermore, at any given relative humidity, it holds less water than glycerol, permitting greater control over the composition of products to be plasticized. G-2401 does not crystallize under normal operating or application conditions. It retains appreciable viscosity even while holding relatively high percentages of water. *Atlas Powder Co., Industrial Chemicals Div., Wilmington 99, Del.*



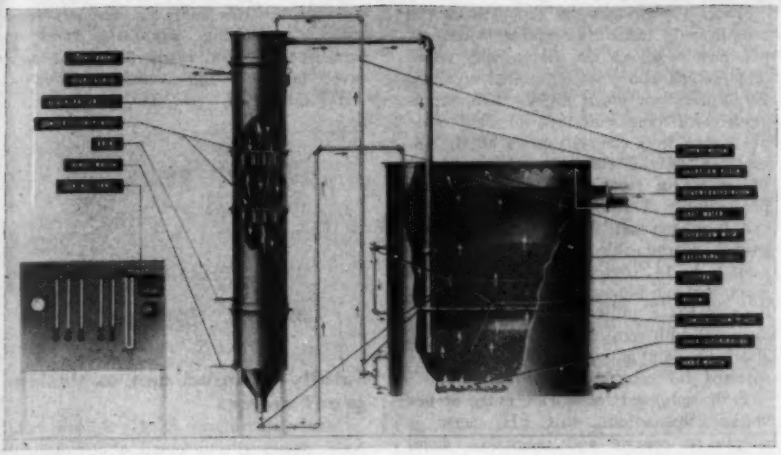
Ball bearing pillow blocks

New ball bearing pillow blocks with pressed steel housings, designed for applications where speeds are relatively low and loads are light, have been announced. The new bearing blocks cost less yet give all the advantages of precision anti-friction bearing performance, according to the manufacturer.

A precision deep-groove single row ball bearing, self-aligning in all directions, provides smooth operation and long life. Free-rolling action and full load capacity are maintained even with minor shaft deflection or normal misalignment, it is claimed. A long inner ring distributes the load evenly over a large shaft area.

Series JPS-200, as these new pillow blocks are designated, is available for shafts from 5/8 to 1 1/4 in. in diameter. The pillow blocks are easily installed by slipping the inner ring onto a shaft and locking it into position. Slotted bolt holes permit easy lateral adjustment.

A synthetic rubber lip-type seal, integral with the bearing, provides maximum sealing efficiency to retain the lubricant and to exclude dirt. No further lubrication is necessary, according to the manufacturer. *Link-Belt Co., 307 N. Michigan Ave., Chicago 1, Ill.*



Water softener

The Hydro-Softener for continuous softening of process water containing 200 ppm or less total hardness has been announced. From such quality raw water this softener will produce an effluent containing less than 5 ppm hardness suitable for boiler feed water, according to the manufacturer. The softening is achieved through the medium of base exchange resin, a portion of which is continually regenerated with brine in a separate column, thus eliminating batch operation.

This new water softener consists of two elements, a two-compartment softening cell and a five-compartment resin regeneration cell, both of cylindrical welded steel construction. In addition, panel mounted controls are provided for regulation of resin transfer, brine and wash water flows, and measurement of regenerated resin purity. The two compartments in the softening cell are separated by a perforated diaphragm, and each contains an equal amount of base exchange resin. Steel plates fitted with pipe nipples define the five compartments of the regeneration cell through which resin flows continuously.

The manufacturer claims the greatest advantage of this softener is the uninterrupted production of treated water of constant quality. Other advantages are: lower initial installation costs; slightly reduced operating costs; operation on a part-time basis, if desired; and less danger of contaminating treated water with brine.

A single Hydro-Softener treats between 75 and 800 gpm, depending upon the combination of various size cells and the amount of hardness in the raw water. *Dorr Co., Barry Place, Stamford, Conn.*

Integral strainer steam trap

A new, larger model, designated as No. 882, has been added to the Armstrong line of integral strainer steam traps. The new trap is said to cost less than a standard trap plus separate Y-type strainer, and few fittings are required to install it. It is recommended for use where dirt and scale conditions are bad.

A stainless steel strainer screen is located in the body casting at the bottom of the trap. The No. 882 has horizontal and opposite pipe connections of 1/2 or 3/4 in. size. Capacity ranges from 1300 to 2200 lb. condensate per hour. Maximum operating pressure is 250 psig. Except for the built-in strainer, the trap is identical to the company's No. 812 side inlet, side outlet trap.

The strainer bushing has straight threads, and there is a copper asbestos gasket between the bushing and body to prevent rusting-in or "freezing." The body is fine grained cast semi-steel. Internal parts are chrome steel and stainless. Over-all trap height is 8 11/16 in., diameter 5 5/8 in. Weight is 15 lb. *Armstrong Machine Works, Three Rivers, Mich.*

Coating release agent

"Release-Cote," a new release agent for adhesive and coating application equipment, is said to prevent adhesives, lacquers, resins, paints or other coating materials from adhering to the walls of pots, tanks, rollers, shafts, feed tables, and other exposed surfaces.

The manufacturer claims that this release agent will reduce clean-up time by at least 50 per cent because it prevents build-up of adhesives on journals and side and when the adhesive dries, it may be easily peeled off. Before the machine is filled with adhesive, a film of "Release-Cote" is applied to all exposed surfaces (except applicator rollers) with a brush, rag, sponge or spray equipment. At clean-up time coated areas can be quickly cleaned with warm water, or simple water rinse.

This material can also be used on the hands to prevent the adhesive from sticking to the skin. There are no harmful irritants, fumes or offensive odors. *Potdevin Machine Co., 285 North St., Teterboro, N. J.*

Line-operated pH meter

Low price and simplicity, outstanding features of the new Model 115 line-operated pH meter, have been achieved, according to the manufacturer, without sacrificing either accuracy of measurements or stability of needle indications, by taking advantage of the most recent developments in the field of amplifier tubes and electronic circuit design.

proven by performance

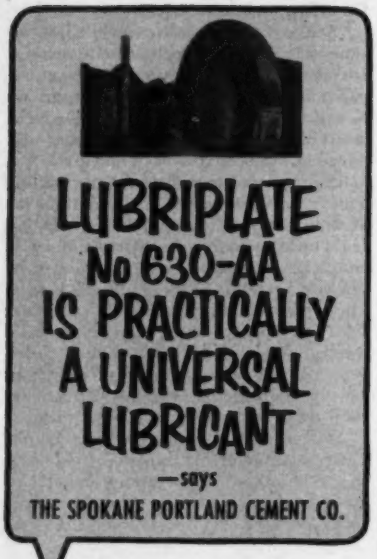
Sutherland Inc. Pressure Washing*
Sold and Serviced by

PRESSURE WASHING

SUTHERLAND REFINER CORPORATION

*U. S. Patent No. 2,355,091

TRENTON 8, NEW JERSEY

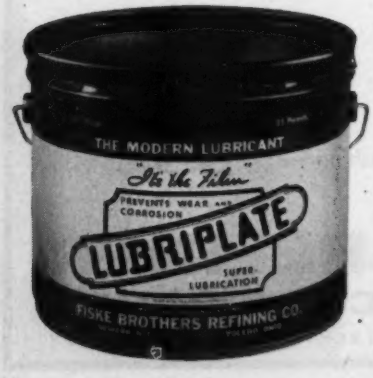


"With the introduction of LUBRIPLATE No. 630-AA, we were able to satisfy all our needs for solid type lubricants with only two LUBRIPLATE Products. LUBRIPLATE No. 630-AA might almost be considered a universal lubricant. Furthermore, it has effected marked savings in both lubricants and labor!"

REGARDLESS OF THE SIZE AND TYPE OF YOUR MACHINERY, LUBRIPLATE GREASE AND FLUID TYPE LUBRICANTS WILL IMPROVE ITS OPERATION AND REDUCE MAINTENANCE COSTS.

LUBRIPLATE is available in grease and fluid densities for every purpose... LUBRIPLATE H. D. S. MOTOR OIL meets today's exacting requirements for gasoline and diesel engines.

For nearest LUBRIPLATE distributor see Classified Telephone Directory. Send for free "LUBRIPLATE DATA BOOK"... a valuable treatise on lubrication. Write LUBRIPLATE DIVISION, Fiske Brothers Refining Co., Newark 5, N. J. or Toledo 5, Ohio.



Model 115 bridges the gap between the complicated, difficult-to-service, electronic pH meters of earlier design and visual color comparison tests of limited accuracy. At a price not much higher than better-grade color comparison sets, this easy-to-use pH meter, it is claimed, offers all the advantages of the electronic glass-electrode pH meter in regard to accuracy and reproducibility of measurements.

A four inch scale with 140 division lines permits reproducible readings to 0.05 pH from 0 to 14, continuous through neutral point without range switching. For titrations it has a millivolt scale from +400 to −400 with zero-center setting of needle, also 0 to +800 and 0 to −800 with needle adjusted for zero at end of scale.

Fully stabilized for a wide range of line voltage fluctuations, this pH meter is simple to operate and maintain. Compactly designed, it weighs 3 lb. and measures 5½ x 7½ x 3 in. *Photovolt Corp., 95 Madison Ave., New York 16, N. Y.*

Simplified slitter

A new simplified and inexpensive slitter has been added to the Inta-Roto line of laminating and other machines for foil, film and paper converters. It is designed for the laminator whose product is to be printed in later operations on multi-color web-fed presses.

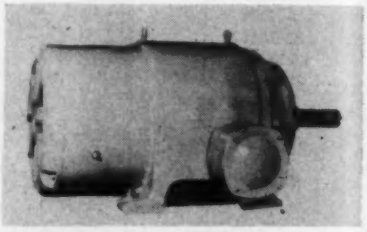
The slitter is belt driven. There are no gears; consequently, it operates without chatter, which may disturb register in subsequent printing operations. It is a surface-type rewinder. Rolls which have been divided will fall apart easily.

The machine may be purchased with automatic web guide for web widths up to 72 in. *Inta-Roto Machine Co., Byrd Airport, Richmond, Va.*

Union bonnet gate valves

Full production of a new line of 125 and 150 lb. union bonnet bronze gate valves has been announced. These new valves incorporate heavy, lug-type hexagonal union rings designed so as to require a minimum of turning effort to seal the flat-mating surfaces of body and bonnet against leakage.

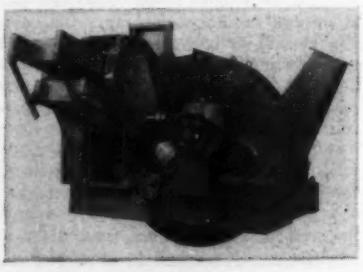
The new union bonnet gate valves are equipped with the new OIC 40 alloy valve stem material. Laboratory and field tests on all OIC bronze valves, it is claimed, have demonstrated that this new alloy adds from 20 to 30 times to the operating life of the valve stem. Material characteristics of the new alloy are freedom from galling or seizing, permitting stems to turn smoothly and easily under the most severe field operating conditions. *Ohio Injector Co., Wadsworth, Ohio.*



Totally-enclosed and explosion-proof motors

Maximum ratings of U. S. horizontal totally-enclosed fan-cooled and explosion-proof motors available have been increased to 150 hp. The totally-enclosed fan-cooled motors, known as Type SD, are designed for protection against dirt, moisture, oil and chemicals. The explosion-proof motors, Type SE, are designed for service where inflammable gases, volatile liquids or combustible dusts may be present. Type SE motors are supplied with the Underwriters' Laboratories label for Class I — Group D, and Class II — Groups F and G.

Both type motors are double-enclosed with a built-in fan for full ventilation and greater heat dissipation. Additional features include asbestos-protected windings to withstand high temperatures; stator cover plate which can be easily removed for inspection or cleaning; solid, dynamically balanced, cast aluminum rotor; Lubriflush bearings for re-lubrication without disassembly, and normalized castings for permanent machining accuracy. *U. S. Electrical Motors Inc., Box 2058, Terminal Annex, Los Angeles 54, Calif.*

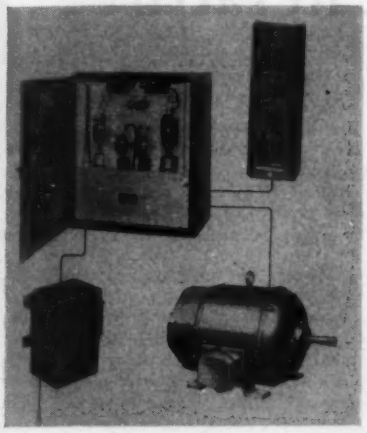


Wastewood chipper

With the spout feed mechanism synchronized to the speed of the disc, the new 75 in. diameter four-knife wastewood chipper will produce quality specification and uniform size pulpwood chips from saw mill refuse, according to the manufacturer. The damping device utilizes all the wood yet holds slivers to the minimum, it is claimed.

The chipper can be driven by either an electric motor or Diesel engine. The newly designed mechanical spout feed mechanism operates from reversible electric motor or from power take-off, if Diesel operated. Capacity when operated at 500 rpm and set to cut ⅝ to ¾ in. chips is approximately 10 cords per hour. Its weight is 24,000 lb., and the over-all

dimensions are 11 ft. 5 7/16 in. long, 9 ft. 4 in. wide, and 7 ft. 4⅝ in. high. It is available with blower housing, if pneumatic chipper conveying is desired. *D. J. Murray Mfg. Co., Wausau, Wis.*



Stepless adjustable-speed drive

The electronic Select-A-Spede, a new adjustable-speed drive, has recently been announced. It is designed for operation from ac power lines and is available with dc drive motors in standard NEMA frame sizes, ¾ to 15 hp.

The manufacturer claims four important advantages for this drive: precision speed control; unusually wide speed range where required; adaptability to a variety of optional electrical and mechanical modifications, and the use of new, simple, reliable electronic circuits.

This new unit is built with speed ranges of 5:1, 20:1, or 50:1, with 100:1 available for some applications.

The complete unit consists of an anode transformer, electronic control panel, push-button station, and a specially designed adjustable-speed dc drive motor. Standard safety features include a fail-safe circuit in case of tube failure, and current-limit control to safeguard driven machine and motor from overload, jamming, or too rapid acceleration.

This drive is especially designed for applications, such as paper machines, where flexibility and close speed control are necessary. *Louis Allis Co., Milwaukee 7, Wis.*

Stainless steel valve

A new stainless steel valve designed especially to meet the rigid appearance and service requirements of the chemical and related industries has recently been announced.

Featuring a rugged, compact shell cast body and guided precision cast V2B disc, this union bonnet, inside screw, nonrising stem valve is available in ½, ¾ and 1 in. sizes. Most exterior surfaces, with the exception of the shell cast body, are polished. *Cooper Alloy Foundry Co., Hillside, N. J.*

New Products Briefs . . .

PAINT STRIPPERS—Two new paint strippers, Composition No. 56 and No. 57, designed respectively for tank immersion stripping and brush-on stripping of a wide variety of alkaline-resistant paints and lacquers, are now available. Composition No. 56 is a thin-bodied solvent, neutral in character, having a pH of 7. Composition No. 57 is a viscous solvent intended to replace combinations of non-viscous solvent detergents and thickeners when stripping finishes from vertical and inverted surfaces of equipment. Both are non-flammable and contain no phenols, cresols, acids or alkalies. *Oakite Products, Inc., 116 Rector St., New York 6, N. Y.*

SEALING DEVICE—A new sealing device for sealing of bolts and studs at either high or low pressure, gas, liquids or air, has been developed. Called the "Stat-O-Seal," this device uses the principle of controlled confinement of the sealing gland. The necessity for sealing compounds is eliminated, and the sealing devices can be reused. "Stat-O-Seals" are non-directional and cannot be assembled up-side-down. The relative mass-voids provided will not vary. *Franklin C. Wolfe Co., 3644 Eastham Drive, Culver City, Calif.*

POLYMETHOXY ACETALS—A series of polymethoxy acetals (PMACs) of varying viscosities is now being offered in semi-commercial quantities. They are mixed long chain methoxy acetals miscible with a wide variety of organic liquids and compatible with water insoluble plasticizers. *Commercial Development Dept., General Aniline & Film Corp., 435 Hudson St., New York 14, N. Y.*

Chips and Hogged bark Conveyed Pneumatically

2000 lb. per minute
Distances up to 3000 feet

Positive • Automatic

Vaults —
store chips and rehandle without manual labor; 22,000 cubic feet or less.

Stokers —
feed shavings, sawdust, hogged crates, boxes, skids, etc., and bark to furnaces for maximum steam production.

The Allington & Curtis Mfg. Co.

Saginaw, Michigan

LEADERS SINCE 1886

The Paper Industry New Literature

Books

PREPARATION OF PAPER COATING COLORS (TAPPI Monograph Series—No. 11). Published by the Technical Association of the Pulp and Paper Industry, 155 East 44th St., New York, N. Y. 6 x 9. 62 pages. Paper-bound. "This monograph is an attempt to set forth, within the limitations imposed, some of the methods now in use in color making and testing." A brief history of paper coating colors is presented in the introduction. Material covered in this monograph is grouped under the following chapter headings: Dispersion of Coating Colors; Coating Color Preparation for the Champion Machine Coating Process; Preparation of Paper Coating Colors by Converting Starch in the Presence of Pigments; Preparation of High Solids Casein Coating Mixtures; Color Preparation in the Specialty Mill, and Rheology in Paper Coating. A glossary and an explanation of symbols used are included.

TREES OF THE UNITED STATES AND ALASKA (Agriculture Handbook No. 41). Published by Forest Service, U. S. Department of Agriculture, Washington 25, D. C. (Order from Superintendent of Documents, Government Printing Office, Washington 25, D. C.). 450 pages. $2.00.

The third official tree list of the Forest Service, this book supercedes and is a thorough and complete revision of Miscellaneous Circular 92. This list of 1027 trees of the United States and Alaska, compiled by Elbert L. Little, Jr., of the Forest Service, under the direction of the Forest Service Tree and Large Plant Name Committee, gives the name, other common names, range of native and naturalized American trees, bibliographic citations, and other information.

The book is confined to trees which, for the purpose of listing, are defined as woody plants with a single erect stem or trunk, three inches or more in diameter at four and one-half feet above the ground and at least 12 feet high. Large willow trees with several trunks springing from the same root and other similar trees are also included in the list.

RAW MATERIALS FOR MORE PAPER (FAO Forestry and Forest Products Study No. 6). Published by the Food and Agriculture Organization of the United Nations, Rome, Italy. Distributed by Columbia University Press, 2960 Broadway, New York 27, N.Y. 6 x 9. 172 pages. $2.00. Paper-bound.

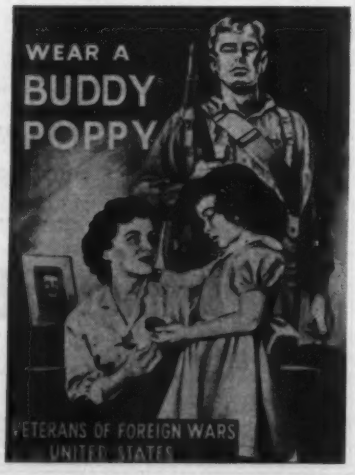
The possibilities of expanding facilities for the manufacture of pulp and paper are covered in this book, the general purpose of which is twofold. The first phase reviews the status of current practice and the application of various pulping processes to new fibrous materials; the second describes pulping procedures and tests for such materials in a manner which will allow comparisons to be made of results obtained in different laboratories, without wide duplication of effort.

Among the subjects covered in the 13 chapters of this book are: fibrous raw materials in current use for pulp and paper; pulping processes for wood and non-wood materials; suitability of fibrous raw materials for different paper products; process cost estimates for pulping fibrous raw materials; case histories for tropical broad-leaved woods, straw, sugarcane bagasse, and bamboo; raw materials testing procedures; pulping procedures; bleaching, and pulp testing procedures.

Booklets and Pamphlets

SILICATE FIBRE BOX MANUAL. Published by Sodium Silicate Manufacturers' Institute, P. O. Box 281, William Penn Annex, Philadelphia 5, Pa. 4½ x 7. 20 pages. Under five major sections—Operating Suggestions, Single Facer, Double Facer, Storage and Handling Silicate, Safety Hints—this booklet outlines and illustrates suggestions for efficient production of corrugated board. The manual is especially arranged for quick reference and easy reading by corrugator operator personnel.

THE CLEANING OF PAPERMAKERS' FELTS (Vol. II, No. 3). Published by F. C. Huyck & Sons, Rensselaer, N. Y. 6 x 9¼. 8 pages. The purpose of this booklet is to review washing procedures in a general way and to provide formulas which have broad application in the industry. It discusses new detergents, the use of chemicals, three accepted methods of washing now practiced by the paper industry, and methods of application and general formulas for these three methods. The concluding section of the booklet discusses Huyck service.



PROGRESS IN SCIENTIFIC MANAGEMENT, 1932-1953. Published by American Management Association, 330 W. 42nd St., New York 36, N.Y. 6 x 9. 30 pages. This booklet is a complete catalogue of AMA publications in eight fields of management: personnel, manufacturing-production, office management, marketing, financial management, insurance, general management and packaging. A brief description and the price of each booklet published during the past five years are given. The booklets listed in each section are grouped according to the year in which they were published. Less recent publications and out-of-print items are catalogued by title, series number and year only. Research reports and other special publications are also listed.

GROWING WOOD FOR AMERICA. Published by American Forest Products Industries, Inc., 1816 N St., N.W., Washington 6, D.C. 4 x 7. 32 pages. Based on the latest available forestry statistics for the United States, this booklet answers many of the questions resource-conscious Americans have been asking about this country's timber supply. Photographs, charts, and illustrations are used to depict the nation's new forest economy based on the growing and harvesting of continuing crops of trees for today and tomorrow.

BIBLIOGRAPHY OF FOREST INDUSTRY EDUCATIONAL MATERIALS. Published by American Forest Products Industries, Inc., 1816 N St., N.W., Washington 6, D.C. 4 x 9. 12 pages. This pamphlet contains an up-to-date listing of motion picture films, booklets, folders, and other forest industry teaching aids now available from individual pulp and paper companies, lumber manufacturers, plywood and veneer firms, and forest industry associations throughout the United States. Suggestions for ordering are included.

CAUSTIC SODA. Published by Columbia-Southern Chemical Corp., 420 Fort Duquesne Blvd., Pittsburgh 22, Pa. 64 pages. This manual gives a completely detailed history of caustic soda. Chapters are devoted to production and uses, methods of manufacture, forms and grades, shipping and handling, comparative economics of solid and liquid caustic, etc. An extensive technical data section includes tables and charts, outlines the properties of caustic soda, and provides complete data on methods of analysis and mixing caustic soda solutions.

Announcing the NEW **HANCHETT**

MODEL SK-24

SLITTER KNIFE GRINDER
for
Top or Bottom SLITTERS
WET GRIND

- *finest finishes*
- *extreme accuracy*
- *rigid construction*
- *capacity 3" to 24" diameter*
- *semi or fully automatic*
- *positive and accurate fixturing*

HANCHETT MANUFACTURING COMPANY
World's Largest Manufacturer of Knife Grinding and Saw Sharpening Machinery
MAIN OFFICE — Big Rapids, Michigan WEST COAST — Portland 1, Oregon

New **RESLIN** SUCTION BOX COVER
PROVEN BY TEST

..OFFERS THESE FEATURES:

Even distribution of fabric assures EVEN WEARING. Ends of threads contact wire assuring uniform surface to wire. Increased wire life. Many years of trouble free service. Resurfacing reduced to a minimum. Does not absorb water. Doesn't contract or expand. Requires no wet storage or care when machine is down. Easily installed. Greater strength and rigidity. Greater open area.

MAKE YOUR SUCTION BOX COVER A RESLIN AND GAIN ALL THE ADVANTAGES OFFERED BY THIS NEW DEVELOPMENT IN SUCTION BOX COVERS.

WRITE FOR FURTHER INFORMATION

APPLETON WOOD PRODUCTS CO. APPLETON WISCONSIN

Sulphite Mill Acid Plants
Semichemical Liquor Plants

Sulphur Burning Plants • Jenssen Two Tower Acid Systems • Gas Coolers—Surface and Spray Type • Jenssen Pressure Acid Systems • Jenssen Auxiliary Process Towers • Recovery Plants—Cooking Acid

SOLUBLE BASE ACID PLANTS
JENSSEN SO_2 ABSORPTION SYSTEMS

For Bleach Plant Application—Sulphurous Acid Preparation
COMPLETE DESIGN AND INSTALLATION

G. D. JENSSEN CO., INC.
WATERTOWN, NEW YORK

WESTERN REPRESENTATIVE:
JAMES BRINKLEY COMPANY, Seattle, Washington

ENGLISH ECCO CLAYS TRADE MARK **CLAYS**

UNIFORM • SUPERIOR • DEPENDABLE

English China Clays Sales Corporation
551 Fifth Avenue, New York City

The Paper Industry

Professional and Business Services

Engineers

Industrial Plants • Textile & Paper Mills • Location Studies • Appraisals • Reports • Surveys

J. E. SIRRINE COMPANY

GREENVILLE SOUTH CAROLINA

Manufacturers' Publications

Through the co-operation of manufacturers and suppliers, THE PAPER INDUSTRY *lists the following catalogues, bulletins and booklets. They may be obtained without cost or obligation, unless otherwise specified, by writing direct to the manufacturers. Please address requests on your company letterhead.*

Measuring Equipment. General Electric Co., Schenectady 5, N. Y.—A revised edition of G-E's 64-page measuring equipment catalogue, this publication contains information on more than 115 testing and measuring devices for laboratory and production line use. The fully illustrated bulletin, GEC-1016A, contains information on products ranging from simple current indicators to completely automatic oscillographs; from surface roughness scales to mass spectrometers; from dc amplifiers to radiation monitors. A brief description of each product and its field of application, condensed tables of important characteristics and prices indicate whether or not the device is suited for a specific job. Reference to more complete bulletins on each type of equipment also is included.

Centralized Lubrication. Farval Corp., 3249 East 80th St., Cleveland 4, Ohio—20-page Bulletin No. 26 describes centralized systems of lubrication. Two pages are devoted to an explanation of the operation of the Dualine measuring valve. Central pumping stations, both automatic and manual, are illustrated. The Dualine, Jr., lubrication system is illustrated and described, as is the spray valve. Numerous photographs show centralized lubrication systems used on different machines in various industries. Twelve advantages of Farval centralized lubrication are listed. The Multival system is illustrated and described. The lubrication survey is explained. Specifications and drawings of fittings and accessories are given on the last two pages.

Variable Speed Drive. Reeves Pulley Co., Columbus, Ind.—Bulletin V-532, consisting of 4 pages, describes the Flexi-Speed drive, the latest addition to the Reeves line of variable speed drives and controls. In addition to showing the flexibility in mounting by means of photographs, the bulletin describes the unit in some detail and gives rating tables, shaft center distances, ordering instructions, and complete dimensions.

Loading and Unloading Equipment. Stephens-Adamson Mfg. Co., Aurora, Ill.—24-page Bulletin 253 (Section 16, Catalogue 66) describes loading and unloading equipment for cars and ships. Equipment covered in the bulletin includes different types of the loader and piler, "Swiveloader," "Swivel-Piler," box car unloader, power shovels, accessories and parts for power shovels, ship trimmers, and ship unloading equipment. Numerous photographs and diagrams are included.

Electronic Pyrometer Controllers. Bristol Co., Waterbury 20, Conn.—Bulletin No. P1248 describes the recently announced free-vane electronic pyrometer controllers. The bulletin illustrates the unit plug-in construction of the new controllers and describes their use for low-open, high-open, low-high, low-open-high, and low-normal-high-control. A model for proportional input control action is also described. Complete specifications and full-size reproductions of actual temperature scales are also included.

Hydrapulper. Black-Clawson Co., Shartle Bros. Machine Div., Middletown, Ohio—Bulletin 14-SB, containing 12 pages, illustrates and explains the 13 sizes of Hydrapulpers.

TECHNICAL DIRECTOR

Excellent opportunity for Technical Director in a progressive pulp and paper mill located in Middle Atlantic States. Prefer PhD. or MS. in Chemistry or Chemical Engineering. Candidates must be at least 35 years of age, possess administrative potentialities and have industrial experience in the field of pulp, paper, coatings, quality control and other related problems. Remuneration will be commensurate with qualifications. Liberal company benefits. Replies held in strictest confidence. Address: Box 569, The Paper Industry

CHEMIST or CHEMICAL ENGINEER

Opportunity available for Chemist or Chemical Engineer in an expanding pulp and paper mill located in the Middle Atlantic States. Age 25-35 years with several years experience in pulp and paper chemicals and fibers. Good salary with excellent opportunity for advancement. Send resume of educational background and industrial experience. All replies confidential. Address: Box 570, The Paper Industry.

WILLIAMS-GRAY COMPANY

221 North La Salle Street

Chicago 1, Illinois

Paul Foster

Barney Benson

Peter Talbot

Ross Lawrence

Herb. Fishburn

Lindsay & Niagara Wires
Knox "Excelsior" Felts
Cotton & Asbestos
Dryer Felts
Carrier Rope
Splicing Tissues
Deckle Webbing
Apron Cloth
Wire Brushes

Superintendent X had the Answer

"We wouldn't keep buying them if they didn't work." That is what superintendent X, who knew, recently told superintendent Y still on the fence.

They were talking about Midwest Auto-flex syphons, thousands of which are today in service because they hold their position and wear indefinitely.

The spring and brace holds the end of the pipe at the proper distance from the bottom of the dryer. It cannot possibly take any other position—hence, proper water and air removal.

The cantilever leverage exerted is lower than with bent pipe syphons, only 170# vs. 354#. It clears instead of dragging on the journal and rapidly wearing out.

Order a few and you'll order more.
Performance as stated guaranteed.

MIDWEST • FULTON MACHINE COMPANY

DAYTON, OHIO

Stadler, Hurter

& Company

CONSULTING ENGINEERS

Specializing since 1923 in all phases of design, modernization and expansion of pulp and paper mills from forest to finished product.

HEAD OFFICE: DRUMMOND BLDG., MONTREAL

New York Office: 74 Beaver Street

ENGRAVED ROLLS

Skilled engravers of applicator and embossing rolls for paper and coating industries.

Southeastern Cylinder Engraving Co.

311 EAST 12th St. Box 1816 CHARLOTTE, N. C.

CARTHAGE MACHINE CO.

●●●

Machinery for Ground Wood and Chemical Pulp Mills.

CARTHAGE, NEW YORK

CONFIDENTIAL EMPLOYMENT SERVICE

For paper and pulp mills and paper converting plants. Our service is rendered without charge to employers seeking executives. No charge to applicant until position is accepted. We invite your inquiries.

CHARLES P. RAYMOND SERVICE, Inc.

Phone: LIberty 2-6547 — 294 Washington St., Boston 8, Mass.

WANTED—Mechanical Engineer to take charge of all plant maintenance in growing pulp and paper mill in North Carolina. Please include summary of background and experience with reply. Address: Box 572, The Paper Industry.

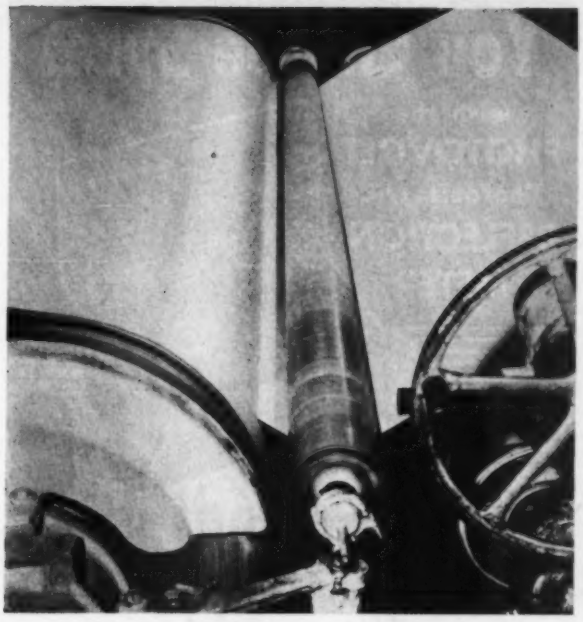
Eleven Publications for Papermakers

Pulp and Paper, Volume I	$15.00
Pulp and Paper, Volume II	15.00
Modern Pulp and Paper Making	9.50
Procedure Handbook of Arc Welding	2.00
Outside U.S.A.	2.50
Drying of Paper on the Machine	1.50
Notes and Observation on Beaters	1.00
Lessons in Papermaking—Part 1	1.00
Lessons in Papermaking—Part 2	1.00
Trouble on the Paper Machine	.75
Pulp Bleaching (A Symposium)	.50
Technology of Papermaking Fibres	.50

Mail your order with payment to:

***The* PAPER INDUSTRY**

431 S. Dearborn Street, Chicago 5, Illinois



Suction Press Rolls Now Cleaned Thoroughly

WITHOUT DRILLING

It used to take 8 men 48 hours to drill through the clogged holes of a suction press roll in a Canadian mill. Not any more! Now the rolls are opened up, thoroughly and safely, in less than 6 hours—and without drilling.

It's all done by chemical circulation. Recommended Oakite solutions are passed through the holes, filtered, and returned to the tank for recirculation. That's all there is to it. You save time, money. Your equipment lasts longer.

Other mills using specialized Oakite materials and methods report as follows:

"Took 2 men 4 days to drill out suction press rolls. Now clean in 4 hours with Oakite solution."

"Well pleased with Oakite cleaning since we will get an added week or two of service from this felt."

"Felts returned to original color after being brown with pitch, and vacuum readings on the suction press rolls dropped as a result of felts being so clean."

FREE BOOKLET gives complete details, including schematic drawing of setup. Also tells how to restore felt absorbency; soak-clean Fourdrinier wires; remove slime and pitch; steam-clean save-alls, etc. Write for your copy—today. Oakite Products Inc., 74 Rector St., New York 6, New York.

SPECIALIZED INDUSTRIAL CLEANING

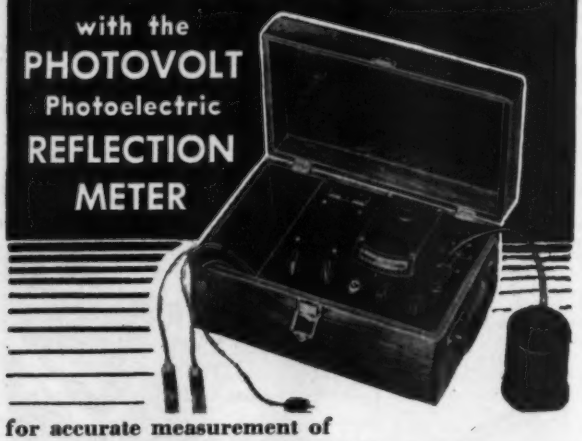
OAKITE

MATERIALS • METHODS • SERVICE

Technical Service Representatives in Principal Cities of U. S. and Canada

You Can Be Sure!

with the
PHOTOVOLT
Photoelectric
REFLECTION
METER



for accurate measurement of

Brightness and Opacity

of pulp and paper in terms of TAPPI specifications.

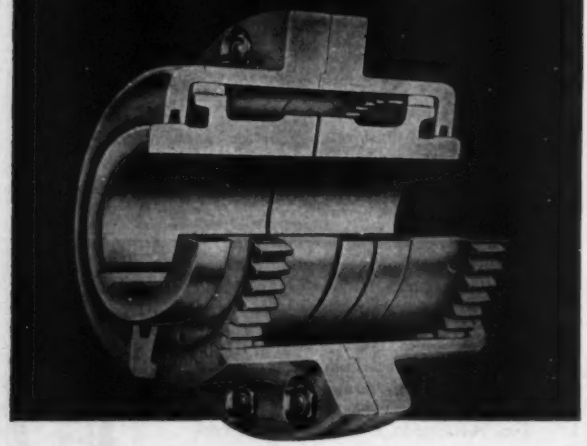
Also for *Gloss and Color*

tests on paper, cardboard, and other paper products.
Portable, reliable, rugged, simple to operate

Also: Colorimeters, pH Meters

PHOTOVOLT CORP.
95 MADISON AVENUE NEW YORK 16, N. Y.

POOLE



A COPY OF CATALOG GIVING FULL DESCRIPTION AND ENGINEERING DATA SENT UPON REQUEST.

FLEXIBLE COUPLINGS

POOLE FOUNDRY & MACHINE COMPANY WOODBERRY, BALTIMORE, MD.

MARKET QUOTATIONS

RAGS (Domestic)

NEW RAGS

The following are quotations to mills, f.o.b. New York:

No. 1 White Shirt Cuttings	11.50 to 12.00
New Unbleached Muslins	14.00 to 14.50
Fancy Shirt Cuttings	6.75 to 7.00
No. 1 Percales	6.75 to 7.00
No. 1 Washables	3.00 to 3.25
No. 1 Light Silesias	7.00 to 7.25
No. 1 Light Prints	5.75 to 6.00
Light Flannelettes	7.25 to 7.50
Cottonades	3.75 to 4.00
Blue Overalls	6.25 to 6.50
Blue Cheviots	6.25 to 6.50
Canton Flannels, Bleached	11.00 to 11.25
Canton Flannels, Unbleached	11.00 to 11.25
Osnaburg Cuttings	7.75 to 8.00
Underwear Cuttings, Bleached	13.75 to 14.25
Underwear Cuttings, Unbleached	13.75 to 14.25
Khaki Cuttings—	
Sun Tan	7.00 to 7.25
Mixed	3.75 to 4.00
Linen Cuttings—	
American	7.25 to 7.50
White	13.00 to 14.00
Grey	13.00 to 14.00

RAGS (Domestic)

OLD RAGS

Quotations to consuming mills, dollars per hundred pounds, f.o.b. New York, follow:

	per cwt.
Roofing	
No. 1	1.00 to 1.15
No. 2	.80 to .85
No. 3 and 4	.60 to .65
Twos and Blues—	
Repacked	2.25 to 2.50
Thirds and Blues—	
Repacked	2.00 to 2.25
Miscellaneous	1.65 to 1.85
Whites, No. 1—	
Repacked	4.00 to 4.50
Miscellaneous	3.50 to 3.75
White, No. 2—	
Repacked	3.00 to 3.25
Miscellaneous	2.50 to 2.75

RAGS (Foreign)

ex dock New York City

NEW RAGS

per cwt.

Nominal:
New Dark Cuttings
New Mixed Cuttings
New Light Silesias
Light Flannelettes
Unbleached Cuttings
New White Cuttings
New Light Oxfords
New Light Prints

RAGS (Foreign)

ex dock New York City

OLD RAGS

per cwt.

Nominal:
No. 1 White Linens
No. 2 White Linens
No. 3 White Linens
No. 4 White Linens
No. 1 White Cottons
No. 2 White Cottons
No. 3 White Cottons
No. 4 White Cottons
Extra Light Prints
Ord. Light Prints
Med. Light Prints
Dutch Blue Cottons
French Blue Cottons
French Blue Linens
Checks and Blues
Linsey Garments
Dark Cottons
Old Shopperies

ROPE and BAGGING

f.o.b. and ex dock New York City

	per cwt.
Gunny No. 1—	
Foreign	4.25 to 4.50
Domestic	4.50 to 4.75
Wool Tares—	
Light	4.75 to 5.00
Heavy	5.00 to 5.50
No. 1 Scrap Bagging	3.75 to 4.00
Manila Rope—	
No. 1 large	7.00 to 7.50
No. 1 small	6.00 to 6.50
Sisal Rope—	
No. 1 large	6.00 to 6.25
No. 1 small	5.50 to 5.75
New Burlap Cuttings	6.00 to 6.50
Jute Threads—	
Foreign (Nom.)	6.00 to 6.50
Domestic	6.25 to 6.75
Strings—	
No. 1 sisal	5.25 to 5.50
No. 2 sisal	4.75 to 5.00
Soft jute	5.25 to 5.50
Mixed	3.00 to 3.25

WASTE PAPER

The following are quotations, dollars per ton, for No. 1 packing f.o.b. New York:

	per ton
Shavings—	
Hard White Env. Cuts.	115.00 to 125.00
Hard White No. 1	90.00 to 95.00
Soft White, one-cut	75.00 to 80.00
Soft White, No. 1	55.00 to 60.00
Coated Soft	40.00 to 45.00
Fly Leaf No. 1	25.00 to 30.00
Fly Leaf, Woody No. 1	25.00 to 30.00
No. 2 Mixed Col. Woody	20.00 to 25.00
Flat Stock—	
No. 1 Heavy Books and Magazines, Repacked	22.00 to 24.00
Mixed Books	16.00 to 17.00
Ledger Stock—	
No. 1 White	55.00 to 60.00
No. 1 Mixed (Colored)	35.00 to 37.50
Manilas—	
New Env. Cuttings	65.00 to 70.00
New Cuts, One-Cut— Extra Manilas	17.00 to 18.00
Manila Tab Cards, Free of Ground Wood	70.00 to 75.00
Colored Tab Cards	45.00 to 50.00
Kraft—	
New Envelope Cuttings	60.00 to 65.00
Tripled Sorted No. 1 100%	40.00 to 45.00
No. 1 Old Assorted	27.50 to 32.50
News—	
White Blank	55.00 to 60.00
Overissue	25.00—
No. 1 Folded	18.00—
Old Corrugated Containers	17.00—
New Jute Corrugated Cuts	22.00—
Mill Wrappers	15.00—
Box Board Chips	12.00—
No. 1 Mixed Paper	11.00—

CHEMICALS

f.o.b. shipping point

Alum (Papermakers)—	
Lump, cwt.	4.55—
Ground, cwt.	3.85—
Powdered, cwt.	4.70—
Blanc Fixe—	
Pulp, bulk, ton	100.00—
Dry, barrels	105.00—
Bleaching Powder— Drums, cwt.	5.00 to 6.00
Casein (Domestic Standard) 20-30 mesh (bags), lb.	
80-100 mesh (bags), lb.	28.00—
Argentine, lb.	21.00 to 22.00
China Clay—	
Domestic Filler Bulk (mine) ton	10.50 to 16.00
Domestic Coating Bulk (mine) ton	17.00 to 25.00
Imported (ship side) Bulk (lump) ton	20.00 to 30.00
Chlorine—	
Tank cars (wks) cwt.	2.93—
Gelatine (silicon), lb.	1.25 to 1.35
Glyc. (C.P.) drums, lb.	33½ to .34
Litharge, powd. bbl. lb.	.15½ to .16

MARKET QUOTATIONS

Rosin (Gum)— New York, per 100 lbs.

E	8.55—
F	8.55—
G	8.55—
WW	8.90—

Rosin (Wood), carlots, F.O.B. South..... 5.00—

Salt Cake—

Dom. bulk (wks) ton.	19.00 to 23.00
Imp. bulks on dock— (Atl. ports) ton (Nom.)	22.00—

Soda Ash—

Bulk (works) cwt...	1.45—
Paper bags, cwt.....	1.75—

Soda (Caustic)—

Solid drums, cwt....	3.70 to 4.45
Ground and flake, drums, cwt.....	4.10 to 4.85

Sodium Silicate—

60 deg. 55 gal. drums, (works) cwt.....	1.60 to 1.70
40 deg. 35 gal. drums, (works), cwt.....	1.35 to 1.40

Starch—

Pearl, 140 lb. bags, cwt.	6.39—
Pearl, barrels, cwt...	6.39—
Paper (Sp.) bags, cwt.	6.39—
Powdered, barrels, cwt.	6.60—

Sulphur (Crude) (Mine) bulk, long ton 26.50 to 28.00

Talc—

Dom. 100 lb. bags (mine) ton.....	25.00 to 28.00
Canadian	35.00 to 45.00

Titanium Dioxide—

Barium Pig, bbls., lb.	.22½ to .23
Calcium Pig, bbls., lb.	.22½ to .23

Zinc Sulphide, bbls., lb. 11.50 to 12.00

WOOD PULP

Quotations on domestic and Canadian wood pulp, dollars per short air dry ton, delivered consuming mills including basic freight allowances, follow:

Bleached Sulphite	140.00—
Bleached Sulphite, Canadian	140.00—
Unbleached Sulphite	120.00—
Unbleached Sulphite, Canadian	120.00—
Bleached Soda	140.00—
Bleached Soda, Canadian	140.00—
Kraft, Bleached	145.00—
Kraft, Bleach., Southern	142.50 to 150.00
Kraft, Bleach., Canadian	145.00 to 150.00
Kraft, Unbleached, Northern	132.50—
Kraft, Unbleached, Southern	95.00 to 105.00
Kraft, Unbleached, Canadian	100.00 to 125.00
Kraft, Semi-Bleached, Southern	140.00—
Sulphite Screenings	72.50—
Sulphate Screenings	67.50—
Groundwood	82.50 to 87.50

Quotations on imported wood pulp, dollars per short ton, on dock American Atlantic ports with varying freight allowances, follow:

Bleached Sulphite, Swedish	140.00—
Bleached Sulphite, Norwegian, freight allowed.	140.00—
Bleached Sulphite, Finnish, freight allowed.	140.00—
Unbleached Sulphite, Swedish	110.00 to 115.00
Unbleached Sulphite, Finnish, freight allowed.	120.00 to 125.00
Kraft, Unbleached, Swedish, freight allowed.	105.00 to 110.00
Kraft, Unbleached, Finnish, freight allowed.	105.00 to 135.00
Kraft, Bleached, Swedish, on dock	142.50 to 145.00
Kraft, Bleached, Norwegian	

PAPER

Quotations are mill quotations New York City

Boards—

Prices per ton, delivered, 10 tons or more:

Plain Chip	85.00—
News vat lined chip	97.50—
Filled news	87.50—
Solid news	90.00—
White vat lined chip	135.00—
Chip tube and can stock	100.00—
Single manila lined chip	140.00—
Single jute lined chip	135.00—
Kraft liner	117.50 to 122.50

White patent coated:

.020	160.00—
.018	162.50—
.016	165.00—

Book Paper—

Machine coated, two sides

70 lb. No. 2 enamel, 25x 38-500, trimmed 4 sides.	4 cases $17.25 Carloads $16.30
45 lb. enamel, 25x38-500, trimmed 4 sides.	4 cases $13.05 Carloads $12.10

Uncoated

55 lb. No. 2 offset, 25x38 500, trimmed 4 sides.	4 cases $14.80 Carloads $13.85
50 lb. A Grade English Finish, 25x38-500, untrimmed	4 cases $14.05 Carloads $13.10
20 lb. envelope, 17x22-500, untrimmed	Carloads $12.40
16 lb. tablet, 17x22-500	Carloads $11.35

Rag Content Bond—

Extra 100% rag	70.45—
100% rag	62.65—
75% rag	48.15—
50% rag	38.90—
25% rag	31.75—

Rag Content Ledger—

Extra 100% rag	72.65—
100% rag	63.90—
85% rag	52.50—
75% rag	49.40—
50% rag	40.20—
25% rag	33.00—

Sulphite Bond—

Air dry bond (Watermarked)	19.00—
No. 1 bond (M.F. watermarked)	15.00—
No. 2 bond (M.F. watermarked)	14.00—
Plain bond (M.F. unwatermarked)	14.00—

Sulphite Ledger—

No. 1, M.F. watermarked	20.50
No. 2, M.F. watermarked	19.50
Plain, M.F. unwatermarked	19.00

News— per ton

Rolls, Standard (Contract)	125.00 to 126.00
Rolls (Spot)	(Nominal)
Sheets	138.00—

Tissues (Carlots)— per ream

White No. 1	1.75—
White No. 2	1.35—
Bleached Anti-Tarnish	2.20—
Colored	2.00—
Anti-Tarnish Kraft	1.65—
Manila	2.00—
Napkins, semi-crepe (12½ lb. to M shts.) per cs.	.90—
Napkins, full crepe and embossed (12½ lb. to Mshts.) per cs.	.90—
Toilet, Bleached (M shts.) per cs.	9.35—
Toilet, Unbleached (M shts.) per cs.	7.90—

Towels— per case

Bleached	6.80—
Unbleached	5.90—

Wrappings (Kraft)— per cwt.

Standard wrapping	8.00—
Butchers, counter rolls	8.50—
Standard bag, mill rolls	7.75—
Shipping sack, mill rolls	8.00—
Gumming, mill rolls	8.25—
Asphalting, mill rolls	8.00—
Envelope, mill rolls	9.50—

Start right.... with the right FELT

Are you getting the production you should be getting to meet today's competitive market? Starting with an Oriskany Waterbury Felt can help you keep quality up to standard and keep production running smoothly . . . for at Oriskany we start right at the beginning to make sure you get the right felt for your job!

We blend the world's finest selection of wools . . . and we make our own yarns under constant scientific controls. Step by step, through weave and finish and inspection, skilled hands are at work in our modern mill tailoring your felt to your exact specifications. Whether you are running the finest tissue or the heaviest board, there is an Oriskany Felt made to do the job *better* . . . *faster* . . . *at less cost!*

First choice—because They last

Oriskany WATERBURY FELTS

H. WATERBURY and SONS CO.

ORISKANY, N.Y.

POSTERS

— A POTENT SAFETY TOOL

Posters should be one of the top aids in your safety program. No other safety medium can reach your entire audience—not once, but many times each day—with such low-cost safety messages. They are directed at the worker acts and worker attitudes that lead to accidents. Posters lend *timeliness, repetition and continuity* to your safety program . . . the three fundamental principles of direct selling.

The National Safety Council maintains a stock of posters that covers all industries, operations and phases of safety and health. These posters are produced in three sizes: "A" size, 8½" x 11½"; "B" size, 17x23"; and "C" size, 25x38". Their colorful illustrations and eye-catching captions make them ideal for the mass selling of safety.

Write for a free copy of the Directory of Occupational Safety Posters. This 72 page catalog illustrates 744 posters, indexed and classified for specific operations.

NATIONAL SAFETY COUNCIL

425 N. Michigan Ave.
Chicago 11, Illinois

The Paper Industry Index to Advertisers

When writing them, please mention The PAPER INDUSTRY.

Refer to the Paper and Pulp Mill Catalogue and Engineering Handbook at your mill office, for complete listing of all advertisers' products.

Advertising Council, Inc.
Albany Felt Company, Inc.
Allington & Curtis Mfg. Co. 223
Amercoat Corporation 107
American Car & Foundry Co.
American Cyanamid Co.
American Defibrator, Inc. 215
American Pulp & Paper Mill Supt. Assn. 166
Antara Chemicals Div., General Dyestuff Corp.
Appleton Machine Co., The 106
Appleton Wire Works, Inc.
Appleton Wood Products Co. 225
Appleton Woolen Mills 168
Armour and Company
Armstrong Machine Works 199
Arnold, Hoffman & Co., Inc.
Askania Regulator Company 201
Asten-Hill Mfg. Co.
Aurora Pump Company 196

Babcock & Wilcox Co., Tubular Products Division 108
Bagley & Seawall Co., The
Bailey Meter Co. 195
Barco Manufacturing Co. 101
Bauer Bros. Co., The 116
Beloit Iron Works 167
Binks Manufacturing Co. 192
Bird Machine Company 136
Black-Clawson Co., The 119
Bowsher Co., The N. P.

Cameron Machine Co. 209
Carthage Machine Co. 227
Chicago Bridge & Iron Company 173
Classified Advertising 226, 227
Clinton Foods Inc.
Cochrane Chemical Co.
Combustion Engineering, Inc. 205
Corn Products Refining Co. 128
Cuno Engineering Corp. 8
Curlator Corporation 177

DeZurik Shower Company 213
Downingtown Mfg. Co.
Draper Brothers Company 132
du Pont de Nemours & Co., E. I.

Eastwood-Nealley Corporation 214
Ebasco Services, Inc. 211
Edgar Brothers Company
Egan & Co., Frank W.
English China Clays Sales Corp. 225

Fabri-Valve Co. of America
Falk Corporation, The
Federal Fawick Corporation
Fisher Governor Co. 104-105
Fiske Brothers Refining Co., Lubriplate Division 222
Fritz Publications, Inc. 227, 231

Garlock Packing Co., The
General Blower Co.
General Chemical Division, Allied Chemical & Dye Corporation
General Dyestuff Corporation
Gilbert & Nash Company
Goslin-Birmingham Mfg. Co.
Graton & Knight Co. 190
Griswold and Johns 198

Hanchett Manufacturing Co. 225
Hercules Powder Company 203
Hillside Laboratory 213
Hooper & Sons Co., Wm. E. 120
Hubinger Company, The
Hudson-Sharp Machine Company 211
Humphrey Elevator Company 200
Hunt Machine Co., Rodney
Huyck & Sons, F. C. 174

Improved Machinery, Inc. 102
Industrial Cypress Lumber Co.
Industrial Engr. Equipment Co.

Jackson & Church Company 2nd Cover
Jeffrey Mfg. Co., The
Jenssen Company Inc., G. D. 225
Johnson Corporation, The 111
Jones & Sons Company, E. D. 109

Kalamazoo Tank & Silo Co.
Kamyr, Inc. 134-135
Kelco Company 110
Kewanee-Ross Corporation 207
Kidder Press Company
Koehring-Waterous Ltd.

Langston Co., Samuel M. 124
Layne & Bowler, Inc. 3rd Cover
Leeds & Northrup Company
Lewellen Manufacturing Co.
Lindsay Wire Weaving Co., The 204
Link-Belt Company 113
Lockport Felt Company
Lodding Engineering Corp. 126
Lubriplate Div., Fiske Brothers Refining Company 222
Lunkenheimer Co., The 4th Cover

Magnus Metal Corporation
Manhattan Rubber Division 123
Mason-Neilan Regulator Co.
Michigan Pipe Company 218
Midvale Company, The
Midwest-Fulton Machine Co., The 226
Modern Engraving & Machine Co.
Moore & Company, Samuel
Morden Machines Company 129
Mt. Vernon-Woodberry Mills, Inc.
Murray Mfg. Co., D. J.

Nash Engineering Co., The 187
National Aluminate Corp. 1st Cover
National Aniline Div., Allied Chemical & Dye Corporation 133
National Safety Council 230
National Starch Products, Inc.

(Continued on facing page)

Naylor Pipe Company
Newcomb-Detroit Co. 213
Nichols Engr. & Research Corp.
Nitrogen Division, Allied Chemical & Dye Corporation
Norton Company

Oakite Products, Inc. 227
Oldbury Electro-Chemical Co.
Oliver United Filters, Inc.
Orr Felt & Blanket Co.
Overly's, Inc. 211

Pandia, Inc. 208
Paper and Pulp Mill Catalogue 231
Paper Industry, The 227
Penick & Ford, Ltd., Inc. 178
Perkins & Son, Inc., B. F. 232
Permutit Company, The
Photovolt Corporation 228
Poole Foundry & Machine Co. 228
Powell Valves 127
Pusey & Jones Corp., The

Raybestos-Manhattan, Inc. 123
Raymond Service, Inc., Chas. P. 227
Red-Ray Mfg. Co., Inc.
Ronningen-Petter Company 181
Ross Engineering Corp., J. O. 115

Sandy Hill Iron & Brass Works 188
Shenango-Penn Mold Company
Shuler & Benninghofen 191
Sirrine Company, J. E. 185
SKF Industries, Inc. 194
Smidth & Co., F. L. 112
Smith Company, S. Morgan
Solvay Process Division, Allied Chemical & Dye Corporation 122
Southeastern Cylinder Engraving Co. 227
Stadler, Hurter & Company 227
Staley Mfg. Co., A. E. 125
Standard Oil Co. (Indiana) 118
Stebbins Engineering & Mfg. Co. 212
Stein, Hall & Company 215
Sticht Co., Inc., Herman H. 215
Stickle Steam Specialties Co. 183
Sutherland Refiner Corp. 218, 219, 220, 221
Swenson Evaporator Company

Taylor-Wharton Iron & Steel Co.
Testing Machines, Inc.
Texas Gulf Sulphur Co. 193
Titanium Pigment Corporation 117
Tri-Clover Machine Co. 114
Turner Halsey Company

Ultra Plating Corporation
U.S.A.—Treasury Dept.

Valley Iron Works Company
Vanderbilt Co., Inc., R. T. 130

Waterbury & Sons Co., H. 229
Waterbury Felt Co., The
Weyerhaeuser Timber Co.
Whiting Corporation
Williams Apparatus Co., Inc. 217
Williams-Gray Company 226
Wisconsin Wire Works 211
Wolferz Alloy Equipment, E. C. 197
Worthington Corporation

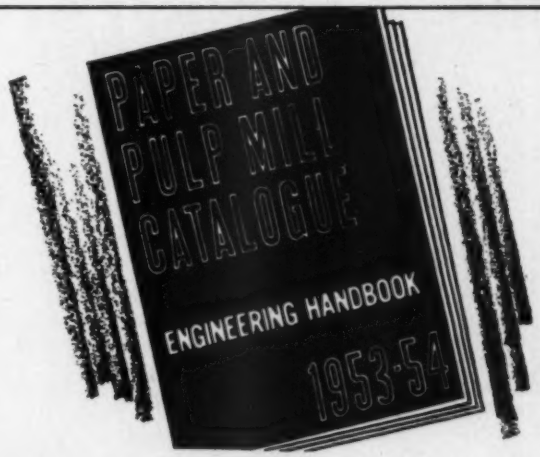
Yarnall-Waring Company 121
Youngstown Welding & Engineering Company, The 216

Professional & Business Services Section

Sirrine Company, J. E. 226

You'll find it in the NEW 1953-54

Paper and Pulp Mill Catalogue



1 **Latest Information**
ON MACHINERY, EQUIPMENT, MATERIALS, CHEMICALS

2 **Sources of Supplies . . .**

3 **Vital Facts of the Industry . . .**

3 BOOKS IN ONE:

MANUFACTURERS CATALOGUE SECTION . . . contains pages and catalogue inserts, giving exact and complete data by manufacturers regarding their products as they apply to the industry . . .

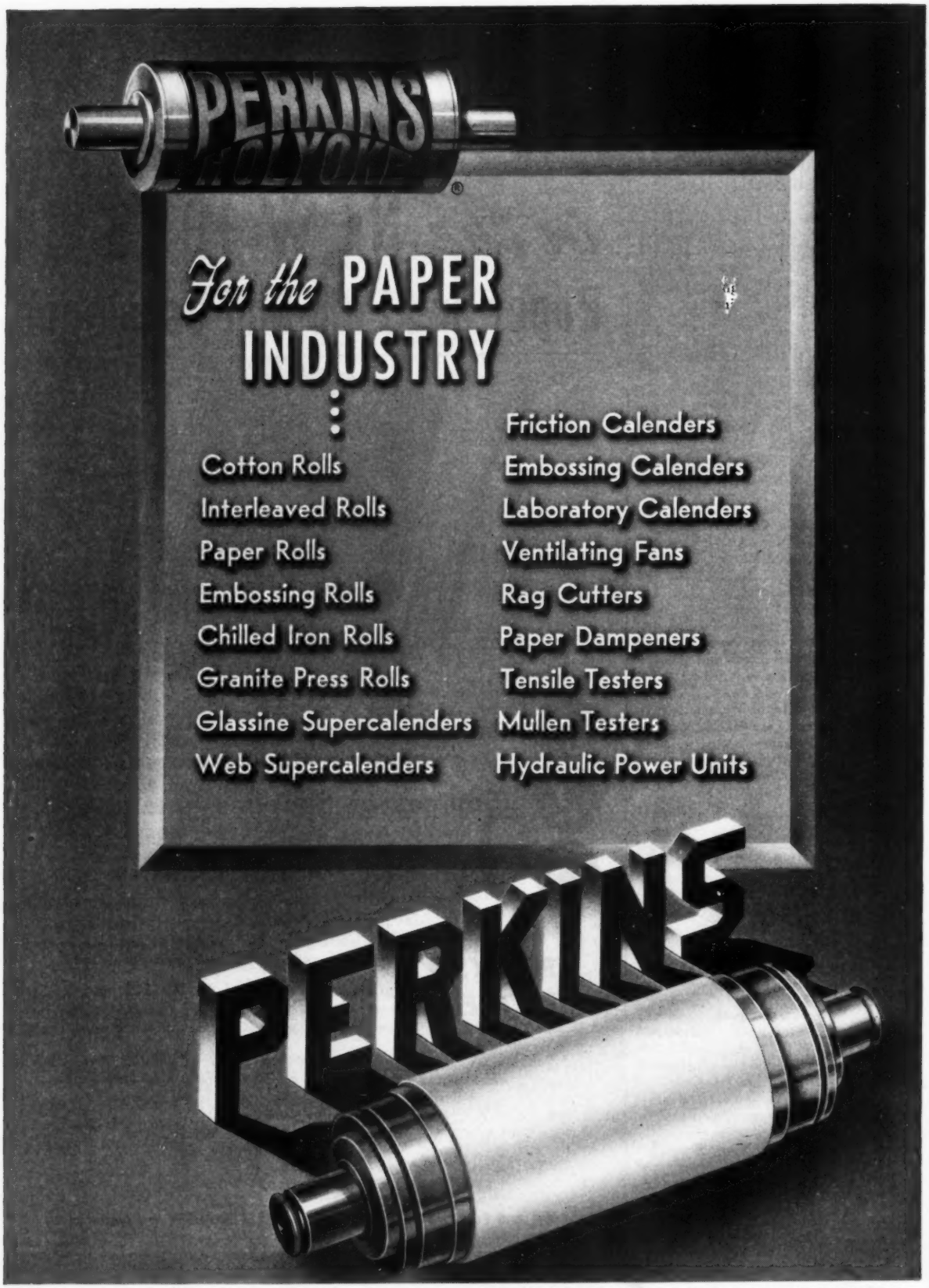
BUYERS SERVICE SECTION . . . is a comprehensive list of more than 4000 products used in the industry, giving a description of their application and the names of manufacturers — 170 pages! . . .

ENGINEERING HANDBOOK . . . is an authoritative compilation of engineering facts of the industry; and provides quick information for the paper and pulp mill executive — 138 pages and more of data, formulas, graphs, charts, and tables.

☆ ☆ ☆ ☆ ☆ ☆

Paper and Pulp Mill Catalogue and The PAPER INDUSTRY are published by

FRITZ PUBLICATIONS, Inc. 431 SOUTH DEARBORN STREET CHICAGO 5, ILLINOIS



B. F. PERKINS & SON, INC. • HOLYOKE, MASSACHUSETTS

But the INTERNATIONAL word for water is LAYNE

Conquering all barriers of space, language and time, Layne service and Layne equipment is known and respected wherever man has need for water. And that need is universal.

Long years ago, a man named Layne with a one man muscle power rig drilled a hole in arid land—then known as Dakota Territory—and the first Layne well went into service. Through the years between, an idea has grown into a service that knows no boundaries and Layne & Bowler, Inc. are today the world's largest developers of ground water resources.

The "know how" that has accumulated in that nearly three quarters of a century is today available to industry, agriculture and municipality. Focused on specific problems through trained engineers and technicians, it is a unique service that includes exploration . . . drilling . . . modernization . . . maintenance and installation of Layne equipment.

From the largest industrial and municipal projects to the small farmer concerned with an irrigation system, that knowledge is available without cost or obligation.

On any problem that relates to water it is wise to first consult Layne & Bowler, Inc. either directly or through an associated Layne company.

Layne

LAYNE & BOWLER, INC.

General Offices, Memphis 8, Tenn.

Layne Associate Companies Throughout the World

An informative booklet "Bulletin No. 100" will be sent free upon request.

This "Working Heart"

LUNKENHEIMER VALVES

Handwheel, stem, and disc . . . these parts are the "working heart" that affects the life of every valve. Lunkenheimer valves are famous for the long, economical service these vital parts give. Take this 200 lb. S.P. "Renewo" Valve, for example:

HANDWHEEL is the new cool-operating "Non-Slip" design that eliminates leakage by enabling the operator to close the valve *tight* with ordinary hand pressure. Four rounded lugs provide a firm grip even when the operator's hands are wet and greasy.

STEM is made of famous "Stemalloy"*, which eliminates stem-thread failure. Amazing exclusive silicon-bronze alloy has exceptional wearing qualities. Millions are in use, and not one has ever been returned due to wear failure.

DISC AND SEAT — 500 BRINELL STAINLESS STEEL — for long, trouble-free service where erosive and corrosive conditions are present. Disc and seat are renewable and can be easily replaced with fullway type seat and disc.

Figure 1021 P.S. 150 lb. S.P.

Figure 73 P.S. 200 lb. S.P.

Figure 16 P.S. 300 lb. S.P.

Figure 1878 P.S. 350 lb. S.P.

* Patented Alloy

Write for Circular 577, a new bulletin which gives you complete information on the "Renewo" line. And for the finest service on valves, see your Lunkenheimer distributor. The Lunkenheimer Company, Box 360S, Cincinnati 14, Ohio.

BRONZE • IRON • STEEL

LUNKENHEIMER

THE ONE *Great* NAME IN VALVES

L-803-19